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*Illustrated.

THE practice of reserving without payment sleeping car accommodations that are not used is attaining such an extent as to suggest the advisability of curtailing or abolishing the privilege of reservation, in the interest of the public as well as of the railways. This is particularly true in the larger cities. A business man in Chicago expects to have to go to New York on some day next week. He telephones for a lower berth or a compartment, knowing that if he does not go the reservation will cost him nothing, even if he fails to notify the road to cancel it. Meanwhile, some one who wants to pay for accommodations is told that no space is available, and goes to another road, or another car is put on. If the first man does not go the road hauls empty space which might have been filled, possibly an extra car. If the second man unwillingly takes an upper berth and finds vacant lowers on the train he is inclined to criticize. It has become a common thing for frequent travelers to reserve accommodations that they have only an uncertain expectation of using, frequently on two or three roads for successive days, causing one, two or three roads to haul empty space or extra cars, and inconveniencing other people. While the practice of allowing sleeping car accommodations to be reserved in advance without payment was undoubtedly a real convenience to many travelers before it was abused, it is questionable if its continuance under present conditons can be justified. The added convenience of a few is gained at the cost of inconvenience to a larger number. If the man who benefits by the practice does not believe this let him reverse the situation, and apply for accommodations for an unexpected trip at a time when he will be obliged to wait for some one to cancel a reservation, or to go by another road. Two or three years ago the roads in the Western Passenger Association discussed a proposal to discontinue free reservations, but no action was taken. One leading western line now refuses to reserve accommodations until they are paid for, and it is probable that the subject will be brought up again. The conditions could be improved without hardship to any one by requiring payment for all reservations when made, with a provision for a refund if notice of cancellation were given within a reasonable time.

WHEN a strike by the firemen of the eastern railways was imminent, Victor Berger, the Socialist member of the House of Representatives from Milwaukee, Wis., introduced a bill for government acquisition of railways. The measure evidently was predicated on the theory that under government ownership railway strikes would be less likely. This is a theory often advanced by advocates of government ownership. It is a theory that the historical facts do not sustain. A bad strike took place on the state railways of Victoria in 1903. The prime minister notified the enginemen's and firemen's unions that they must withdraw from affiliation with the central labor organization, the Trades Hall. He feared such affiliation would embroil the railway employees in labor quarrels with which they had no concern. The answer to him was that unless his notice was withdrawn within 15 hours all the enginemen and firemen would strike; and this they did. The public sided with the government and the strike collapsed. This was followed by legislation, still in effect, which prohibits any employee of the Victorian government from taking any part whatever in politics except to vote for members of Parliament. An illustration of the fact that under government ownership railway employees may dictate to the management, instead of the management to the employees, was afforded by an incident that occurred in Italy soon after government operation of railways was resumed in that country in 1905. Discipline at Rome was bad. The Minister of Public Works decided to transfer there the district manager at Milan and give him authority over the whole States System. This officer had the reputation of a severe disciplinarian. When the railway employees heard of the change they sent a deputation to the Minister of Public Works to notify him that they would all strike if the appointment were persisted in, and the Minister of Public Works yielded. The public's recollection of the great railway strike in France in 1910 must still be fresh. The two state railways, as well as the five large private railways, were involved. The resulting demoralization is graphically described in the report of the board which arbitrated the controversy between the eastern railways in this country and their locomotive engineers. The government took summary and effective action, which in similar circumstances could not be duplicated in the

United States. The ministers on the very day the strike was declared ordered the employees to join their colors for three weeks' military training. The "military training" assigned was that of returning to their work on the railways. Disobedience would be punished by military law. The strike was broken. The next day trains were running into Paris. The advocates of government ownership who say, or imply, that under it strikes would not occur presume too much on public ignorance.

IT appears certain that the present Congress will pass a bill for a valuation of railways (as amended by the Senate). The status of the proposed bill at the time we go to press is indicated by the report printed in another column. As the two houses seem to be in accord, further serious amendment is not to be expected. There is being manifested a desire by the more radical members of Congress to get through a measure giving instructions regarding the way the valuation shall be made that would tend to hold the amount of the appraisal down to the practical minimum. The decisions of the federal courts have not covered the entire subject of valuation. There are, however, certain points to be considered which the Supreme Court specifically mentioned in its opinion in the Nebraska rate case. These include the original cost of construction and of permanent improvements, the probable cost of reproduction and the market value of stocks and bonds. In subsequent decisions in public utility cases—for example, in the Consolidated Gas case—the court has said with equal definiteness that the value to be considered is the present value, and that if the value of a public utility has increased since it was built that is the concern's good fortune and it has a right to benefit by it. There are some people, including some members of Congress, who would like to have the proposed valuation based on the original cost of construction. In other words, they deny the right of a public utility to profit by the "unearned increment" in its real estate. Others would exclude from consideration the investment that has been made from earnings. Others would base the appraisal entirely on the physical machine, and make no allowance for "going value." All these proposals are at variance with the decisions of the Supreme Court. Nothing but harm can result from making a valuation that does not give full weight to all of the factors mentioned by the court. If any of these factors are left out the valuation will be made lower than the decisions warrant. The public will be given the impression that the value of the railway properties is less than it actually is. If the Interstate Commerce Commission should then try to regulate rates and earnings on the basis of the valuation the courts would reverse it. That large part of the public that wishes to see railway rates made as low as possible would be disappointed, and unfair sentiment against the courts as well as against the railways would be increased. Much of the present hostility to the courts has been developed by the action of Congress and the state legislatures in passing laws of the most doubtful constitutionality, thereby "putting it up to the courts." The property of public utilities is just as private in its ownership as any other property. The constitutional provisions safeguarding property apply to it just as much as to other property. These constitutional safeguards can be removed by amending the Constitution. Until they are removed it is just as much the duty of the law-makers to observe them as it is of the courts. The stockholders of railways have nothing to fear from a valuation based on the same factors that would be included in the valuation of any other kind of property. They have no reason to fear the immediate effect of attempts to confiscate their property, because the courts usually defeat them. But all owners of property have reason to fear attempts by law-making bodies to pass legislation which the courts in obedience to constitutional mandates must nullify, and in the process of nullifying which they incur an odium and a public hostility that bodes ill for American institutions in general.

C. E. RUSSELL VS. THE INTERSTATE COMMISSION ON RAILWAY CAPITALIZATION.

CHARLES EDWARD RUSSELL, returns to the attack on the railways in an article in *Pearson's* for March. He continues to discuss railway accidents, and in this article strives to show that the decrepit condition into which, as he alleges, the railways of the United States have fallen is due to the increasing burden of their capitalization. He gives a table purporting to show the capitalization from 1902 to 1911 and concludes with the statement, "meantime, I may say that my figures are taken from the Interstate Commerce Commission reports." The figures he gives are from the Commission's reports, but they are for the gross capitalization, which includes duplications due to intercorporate ownership of stocks and bonds, and which the Interstate Commerce Commission has expressly and repeatedly repudiated as representing the actual capitalization of the railways. That his misrepresentations are typical of those put in circulation by critics of railway capitalization in this country is our excuse for noticing them.

Mr. Russell gives $67,936 as the average capitalization per mile in 1906. In its statistical report for 1907, page 17, the Interstate Commerce Commission quoted as follows from its own report on the "Intercorporate relationships of railways in the United States as of June 30, 1906":

> If, however, the problem be to state the amount of securities which are an actual or a contingent claim upon the revenues of the railways of the country considered as a whole, it is evident that the phrase "in the hands of the public" must exclude from outstanding capital all railway holdings. This has been done by the present investigation and results in a reduction of the amount which general discussions have heretofore accepted as measuring the claim of railway securities on railway revenues from $67,936 per mile of line to $58,050 per mile of line.

Mr. Russell gives $70,628 as the average capitalization for the year 1907. The Commission in its Statistics of Railways for 1907, page 76, said:

> The net amount outstanding in the hands of the public on June 30, 1907, if assigned on a mileage basis shows a capitalization of $58,298 per mile of line. *This figure represents correctly the average capitalization per mile of the railways in the United States, meaning by that phrase the amount of active capital to be supported by freight and passenger rates.*

Mr. Russell gives $72,482 as the average capitalization in 1908. The Commission in its Statistics for that year, page 68, said:

> It appears that out of the aggregate amount of $16,767,544,827 of railway securities which are reported by the carriers only $12,833,591,510 are outstanding in the hands of the public on June 30, 1908. *This is equivalent to an outstanding capitalization of $57,201 per mile of line.*

Mr. Russell gives $74,475 as the capitalization per mile in 1909. The Commission in its Statistics for 1909, after referring to the gross capitalization, said on page 56:

> Excluding from this amount the capital reported as assigned to properties other than railway, the remainder, $13,711,867,733, is equivalent to an average of $59,259 per mile of line. It is this figure which measures the amount of railway securities in the hands of individuals and corporations other than railway corporations.

Mr. Russell gives as the average capitalization in 1910, $77,189 The Commission in its Statistics for 1910, page 52, said:

> These statistical reports have for a series of years contained the statements of the average amount of *actually outstanding capital securities per mile of road*, and in continuation of that custom such an average as of June 30, 1910, is here stated. The figure found as of that date is $62,657.

In other words, the figures that Mr. Russell gives as being "taken from the Interstate Commission reports" exceed by $9,888 to $15,281 per mile the figures which the Commission specifically gives as its own figures for average capitalization. Mr. Russell admits that the way he calculates "is not exactly the way the expert railway jugglers figure capitalization." This neatly classifies the Interstate Commerce Commission. He adds that when the experts "have howled sufficiently on this point" he will explain it. It will require some explaining.

Mr. Russell is greatly grieved because, as he says, the railways maintain press bureaus "to influence public opinion," and he asks, "What part of the transportation business is the influenc-

ing of public opinion?" His own articles are one of the best explanations of why railway press bureaus are necessary. When socialistic penny-a-liners hire themselves to muck-raking magazines to misstate the official statistics of the Interstate Commerce Commission regarding railways it becomes needful for the railway managements, in justice to their stockholders and to the public, to employ people to tell the truth about the railway business; and the public will have considerable difficulty in seeing wherein it is any worse for the railways to employ men to refute misrepresentations than it is for muck-raking magazines to employ men to write them.

RAILROAD LANGUAGE.

SHOW Your Tickets! That is a very simple injunction, known to everybody that ever traveled in America, and plain as day. When such a sign is displayed at the entrance to a train platform no one has to ask when, where, or to whom it applies. But in a large new station recently opened, "in a city of over 100,000 inhabitants" (to use the phraseology of certain legislative acts) the architect, or artist, or manager, or painter has adopted the following legend: "All Passengers Will Be Required to Show Transportation at the Gates." By thus using 57 letters instead of 15 the painter lengthens his job 280 per cent.; but it is hard to see any other advantage in the lengthening. That word "transportation," however, will show the rising generation how serenely we can ignore Mr. Roosevelt and others who would make a hobby of simplification. It might be a good idea to add to this sign a suffix informing boys and girls that, after passing through the gates, they will board "equipment" drawn by "power," instead of cars drawn by engines.

Railroad language is not always stilted or redundant. Often it fails of its purpose by reason of its brevity. A general passenger agent recently wrote the following letter (names fictitious):

Chicago, N. Y., February 31.

G. H. CUTTER:—

Dear Sir—In reply to yours of the 20th in regard to through car from Wobbledon to London. We discontinued these through cars some time ago because with so many branch lines and a car from each (and not enough business from any one line to fill a car) we were hauling unnecessary equipment on our already heavy main line trains. In addition to this was the loss of time for switching cars from branch-line trains to a main-line train, thus delaying a great number of people. Take a train from Edinburgh to London and put on a car from each branch as the train proceeds, and I am sure you will appreciate the necessity for our present rule. We feel that the arrangement in effect takes the best care of the great majority, and I trust that you will agree with us in this.

Yours truly,

JOHN SMITH,
General Passenger Agent.

It is a safe wager that Mr. Cutter was not satisfied with this response to his request, or demand. We do not assume that the railway ought to satisfy him; but it would be possible to come very much nearer to the ideal refusal: the refusal of the genius who, as we are often told, can make people swallow his refusals as cheerfully as they accept favorable responses from ordinary people. Traffic officers would do well in many cases to consult the legal department in small matters like this, as well as in things deemed more weighty. The passenger man's suavity and habitual desire to please, combined with the accuracy, philosophy and enthusiasm of the jury lawyer, would produce great results. Mere repetition, with variations, such as a lawyer uses to convince 12 men, could often be profitably used on one man; especially where that man is likely to publish your letter. Statistics of the actual number of passengers carried in each through car, for a series of months, might have softened Mr. Cutter (or might have shown that the experiment of through cars had better be renewed). Taking care of "the great majority" is a delicate point to handle. Probably Mr. Cutter does not belong to the majority; what does he care for that argument? However, we are not thinking of writing the general passenger agent's letter for him; the point is that if a request like Mr. Cutter's is to be refused, it is worth while to answer, very fully, every expressed and unexpressed question that may arise in the applicant's mind, even if the letter has to be amplified or rewritten repeatedly, and by different men.

Brevity is a fault in many of our train rules. One of the best codes of secondary rules (we mean those rules which are supplementary to the standard code and usually numbered from 600 upward) was that in force on the Cincinnati, New Orleans & Texas Pacific ten or 15 years ago, and it was three or four times as long as those of other roads. But, though apparently redundant, it was simple and clear. With proper numbering, paragraphing and headings a subject may be treated as clearly and effectively with 50 rules as with ten. Our fault is that we treat brevity as an absolute necessity, whereas its value is relative.

In the government report on the collision at Irvington, Ind., November 13, a paragraph of the rules of the road referring to signals was quoted as follows:

The definition of a "fixed signal" covers such signals as slow boards, stop boards, yard limits, switch, train order, block, interlocking, semaphore, disk, ball, or other means for indicating stop, caution, or proceed.

Fixed signals out of order had not been carefully reported, and this neglect had become general and was acquiesced in by the officers; and apparently this imperfect way of stating that a switch target and a switch light are to be treated as fixed signals had its influence in causing this laxity. In contrast with this brevity, look at the detail with which the Union Pacific explains to employees the care of gasoline motor cars used by track foremen, a matter which, probably, is of far less importance, or at least one much less directly connected with the safety of trains. The following is a fac-simile, with the type reduced one quarter in size, of some of these U. P. rules:

EXAMINATION QUESTIONS

1. . . . What inspection should be made before attempting to start out with a motor car?

2. . . . What precautions must be observed in handling gasoline?

3. . . . Before leaving a car for any length of time what are the several things that should be attended to?

6. . . . Explain briefly what a carbureter is for and how it works.

7. . . . Why are gasoline engines provided with a timer?

11. . . . When a car has been prepared ready to start and several attempts to start it have failed to produce any results, what are the first two or three things you would look for to determine what is wrong?

Taking the Union Pacific style as a model these signal rules would be set forth somewhat as in the next fourteen lines:

The following are the different kinds of fixed signals in use—

Slow Boards
Stop Boards
Yard Limit Boards
Switch Targets
Train Order Signals
Block Signals, Manual
Block Signals, Automatic
Interlocking Signals
Interlocking Signals, Dwarf
Semaphore Signals
Disk Signals
Ball Signals.

Will not every train-rule examiner endorse this suggestion? On most roads the examiner on train rules is allowed a fair chance only in a part of his work. He ought to have more aid from the printing press. As the development of these simple propositions may be independently taken up by any officer, there would seem to be no good reason for not having the best help

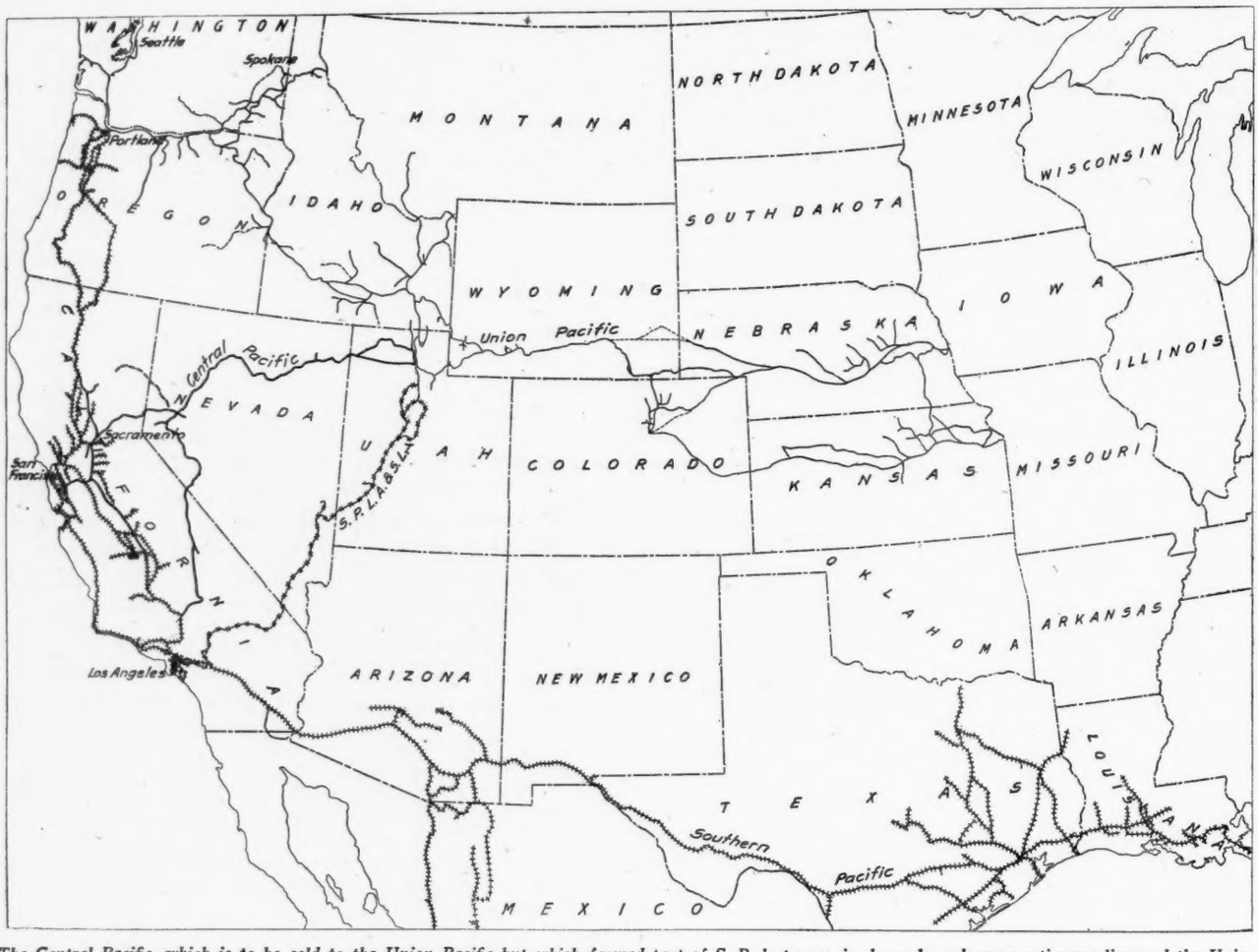
of the printer—the really skilful printer—on every road, and in every superintendent's office.

The language of other train rules, of train orders, of "blue envelopes," of reports of investigations, and other things will be taken up at another time.

SOUTHERN PACIFIC.

RANKING in importance, as an asset, with territory traversed by a railroad are the loyalty and esprit de corps of its organization, and in its separation from the Union Pacific, the Southern Pacific retains not only the form of the Harriman Lines organization, but also the personnel; it loses the Central Pacific, but it retains a territory that is increasingly important as a local territory, and with it the men and the operating and traffic organization that have contributed so much to make the Harriman Pacifics a standard by which to measure all roads operating under western conditions. Of course, there are great stretches of territory along the main line from El Paso west to California that have not begun to develop at all locally, and this six or seven hundred miles of line has to be supported almost entirely from transcontinental business or by the rest of the system, but the Southern Pacific has tributary to its lines thousands of miles of as rich local territory as is to be found anywhere. The Southern Pacific and proprietary companies, including the Central Pacific, operates about 9,970 miles of first main track. Of this mileage the Central Pacific, which has heretofore been controlled by the ownership of all of the stock and operated under lease by the Southern Pacific, and which is now to be taken over by the Union Pacific, has a mileage of 2,105 miles. Excluding this Central Pacific, which forms a main line connecting San Francisco with the western terminus of the Union Pacific at Ogden, the Southern Pacific runs the entire length of the longest and one of the richest states in the Union. It has almost a monopoly of business in many parts of California; it forms a southern base line for all of the southwest, which is developing so rapidly, and runs across some of the richest parts of Texas and through a rapidly developing part of Louisiana, having tributary to its lines, to name but a few of the most important, Portland, San Francisco, Los Angeles, El Paso, Houston and New Orleans.

The Southern Pacific's liberality in its expenditures for maintenance and additions and betterments is proverbial. In the Harriman Lines dissolution the Southern Pacific has lost a very valuable piece of railroad property, a property, however, which was not necessarily an integral part of its system; and has gained on the other hand what may or may not prove to be far more serious—a competitor, where it formerly had a subsidiary.



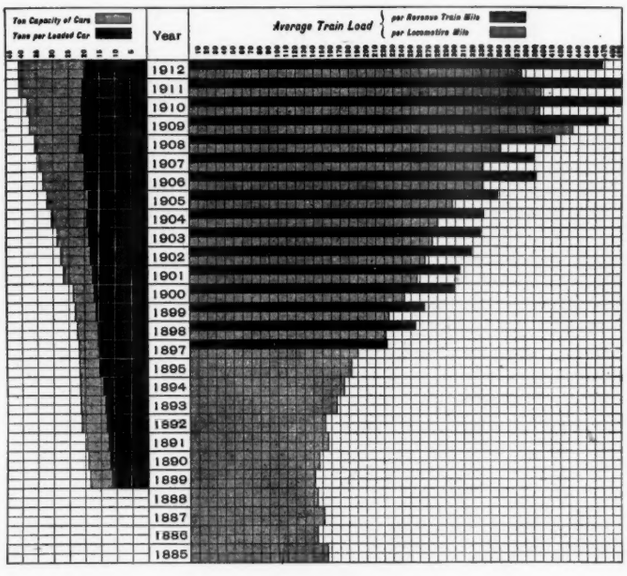
The Central Pacific, which is to be sold to the Union Pacific but which formed part of S. P. last year, is shown by a heavy continuous line and the Union Pacific and its controlled San Pedro, Los Angeles & Salt Lake are shown by distinct symbols.

The Southern Pacific.

The showing made in the fiscal year ended June 30, 1912, was in its gross results, of course, forecast months ago, and the annual report coming so long after the close of the fiscal year, as it does now, is liable to be misleading unless one forcibly gets back into the conditions of the 12 months ended June 30, 1912. Conditions, and especially conditions affecting railroad gross earnings, have changed so materially in the last eight months that a report which would have been considered as simply typical of those conditions if published in July, coming now when we have had six months of large gross earnings,

heavy crop movements, mild operating weather and almost unvaried reports of greatly improved industrial conditions, seems out of the average and bad.

Conditions in the 12 months covered by this report were unfavorable enough to try the best railroad organization in the country. Skilled labor in the Southern Pacific's territory has always been scarce and wages high, and under such circumstances it is hard to get an adequate conception of the difficulties imposed on a railroad company's organization by a strike of 5,189 employees, most of whom were skilled laborers be-



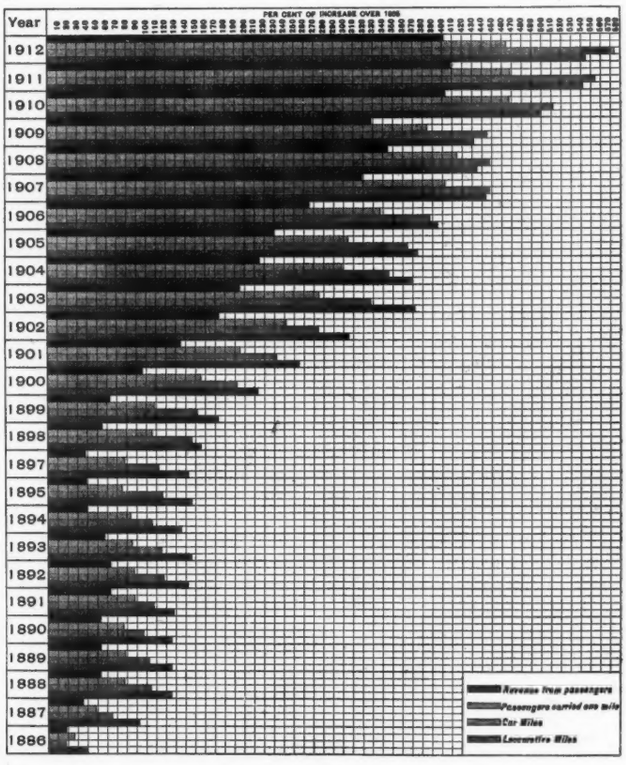
Ton Miles per Train and Car Mile.

longing to the machinists', boilermakers', blacksmiths', car repairers' and sheet metal workers' unions. A strike such as this affects not only expenses but gross revenue to a serious degree as well. Notwithstanding the strike, however, the Southern Pacific earned from operation $131,500,000, which is less by only .83 of 1 per cent. than total operating revenues in 1911. After the payment of operating expenses and taxes there was $39,400,000 net operating income, which is less by $3,350,000 than in 1911. After the payment of fixed charges there was a surplus of $21,700,000, out of which $16,360,000 was paid in dividends, leaving $5,240,000 surplus, comparing with a surplus in 1911 of $9,730,000.

The Southern Pacific carried more passengers and more freight in 1912 than in 1911, but received a lower ton mile and passenger mile rate, and, of course, paid out more in expenses per passenger and per ton of freight. As far as revenue alone is concerned, if the Southern Pacific had been without its Central Pacific in 1912 and had nothing whatsoever to compensate it for this loss, there would still have been a surplus, after the payment of dividends, of $513,436. The Central Pacific pays 6 per cent. dividends on its common stock to the Southern Pacific, which common stock dividends amounted to $4,036,530 in 1912, and 4 per cent. on the preferred, which amounted to $692,000 in 1912. The lease provides that anything over and above 6 per cent. earned on the common stock shall be divided equally between the Central Pacific stockholders and the lessee. In 1912, however, there was no surplus, so that the $4,728,530 received in dividends was the only direct income which the Southern Pacific got from its Central Pacific. If the government's theory that control of the Southern Pacific by the Union Pacific suppressed competition was right, there is then at least a fair chance that the strategic loss of the Central Pacific may be more than made up for by the greater freedom with which the Southern Pacific may solicit and obtain business in opposition to the Union Pacific.

Of course, the Southern Pacific is to be paid in cash for its Central Pacific stock, but the immediate return on the investment of this cash is hardly likely to amount to between $4,000,000 and $5,000,000 a year. The point is this, that with this cash the Southern Pacific will be in a position to make improvements and additions which it would otherwise have to make only through increasing its own interest charges. In the meantime, the growth of business should so add to the Southern Pacific revenue without correspondingly increasing gross that the loss from investment in Central Pacific can be made up. The explanation of the lower ton mile rate received in 1911 than in 1912 is to be found in a comparison of the tonnage of various commodities carried in the two years. The total tonnage carried in 1912 amounted to 26,950,000 tons, an increase of 3.08 per cent. over 1911. Of the 1912 total tonnage, 27.04 per cent. was furnished by products of mines, while of the 1911 tonnage but 26.20 per cent. was furnished by products of mines. On the other hand, products of animals, which in general yield a high average ton mile rate, except under certain conditions such as have obtained between Kansas City and Chicago, furnished but 3.72 per cent. of the total tonnage in 1912, as against 4.27 per cent. in 1911; however, merchandise, which on the Southern Pacific pretty certainly yields a high average ton mile rate, furnished 8.28 per cent. of the total tonnage, as against 8.22 per cent. in 1911; and products of manufactures furnished 16.99 per cent. of the total in 1912 and 16.94 per cent. in 1911. The average ton mile rate was 1.168 cents in 1912 and 1.186 cents in 1911.

The decrease in passenger revenue was due to a shorter



Showing by years the per cent. of increase over the calendar year 1885 in the gross revenues from the transportation of passengers, the number of passengers carried one mile, and the number of miles run by cars and locomotives in passenger-train service, of the Southern Pacific lines from January 1, 1885, to June 30, 1912.

Locomotive miles include revenue passenger-train miles, one-fourth of mixed train miles, and helping passenger-train miles but do not include miles run by motor cars.

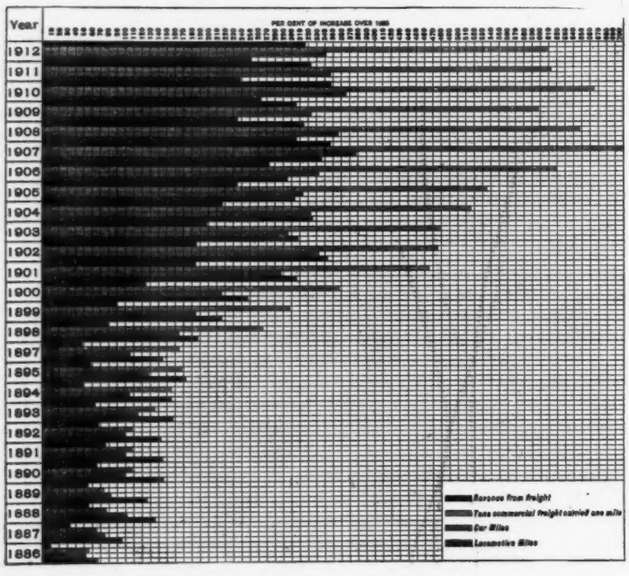
Growth in Passenger Service and Traffic.

average haul per passenger and also to a slight decrease in the revenue per passenger per mile. There were 22,186,000 passengers carried in 1912 and 22,060,000 passengers in 1911. The average

haul, however, was 74.25 miles in 1912 and 75.08 miles in 1911.

Operating statistics reflect the difficulties of operating conditions. The average revenue train load of revenue freight amounted to 382 tons in 1912 and to a little over 384 tons in 1911, which is a decrease of less than 1 per cent.; but total train load, including company freight, decreased from 474 tons in 1911 to 456 tons in 1912—3.84 per cent. With an increase of 1.30 per cent. in revenue freight and a decrease of over 16 per cent. in the ton mileage of company freight, resulting in a decrease in total tons of freight carried of 1.98 per cent., there was an increase of 2.09 per cent. in revenue freight train mileage and of 3.54 per cent. in freight revenue locomotive miles. The mileage of loaded freight cars remained almost the same in 1912 as in 1911, and the mileage of empty cars decreased by 5.35 per cent.

Of course, with a strike of machinists, repairs of locomotives per locomotive cost more in 1912 than in 1911, amounting to $3,893 (including both repairs and replacements) in 1912 and to $3,516 in 1911. On the other hand, other expenses for maintenance were cut down rather heavily. Maintenance of way and structures cost $1,411 per mile of main track in 1912 and $1,571 in 1911; repairs and replacements of passenger cars cost $871 in 1912 and $1,050 in 1911 per car; and repairs and replacements of freight train cars cost $98 in 1912 and $113 in 1911. This was a decrease of over 10 per cent. in maintenance of way, over 17 per cent. in amount spent for repairs of passenger train cars and of over 13 per cent. in amount spent for



Showing by years the per cent. of increase over the calendar year 1885 in the gross revenues from the transportation of commercial freight, the number of tons of commercial freight carried one mile, and the number of miles run by cars and locomotives in freight-train service, of the Southern Pacific lines from January 1, 1885, to June 30, 1912.

Locomotive miles include revenue freight-train miles, three-fourths of mixed-train miles, and helping freight-train miles.

Growth in Freight Service and Traffic.

repairs of freight train cars. The following table shows the per cent. of total operating revenues consumed by operating expenses:

	1912. Per cent.	1911. Per cent.
Maintenance of way and structures and maintenance of equipment	25.56	25.59
Traffic, transportation and general expenses	37.26	35.54

The Southern Pacific, under the plan which has been approved by the attorney general, will receive about $97,000,000 in cash for its Central Pacific stock. This, of course, is in addition to something over $14,000,000 in its own bonds with which the Union Pacific is to make up the balance of the purchase price of Central Pacific stock.

On June 30, 1912, the Southern Pacific had $10.420,000 cash and total current assets, including Union Pacific "bond purchase notes," of $54,420,000. Current liabilities amounted to $36,800,000, which included $12,000,000 due to the Union Pacific. Presumably this $12,000,000 will be subtracted from the cash to be paid by the Union Pacific to the Southern Pacific, so that the S. P. will receive about $85,000,000 cash. This will both put the company in a very strong position for working capital and permit it to spend large sums for additions and betterments and make advances to subsidiary companies for construction for some time to come without doing any new financing.

The following table shows the principal figures for operation in 1912 as compared with 1911:

	1912.	1911.
Average mileage operated	9,970	9,895
Freight revenue	$72,648,092	$73,677,293
Passenger revenue	40,269,238	40,814,400
Total operating revenue	120,433,056	121,911,028
Maint. of way and structures	14,464,205	15,889,130
Maint. of equipment	16,318,141	15,312,206
Traffic expenses	3,201,367	2,947,064
Transportation expenses	38,270,811	36,524,585
General expenses	3,397,583	3,848,676
Total operating expenses	75,652,106	74,521,660
Taxes	5,621,239	4,850,348
Operating income	39,412,888	42,764,978
Gross income	48,265,408	49,500,167
Net income	21,698,845	26,117,207
Dividends	16,361,187	16,361,426
Surplus	5,241,966	9,727,566

NEW BOOKS.

Economics of Railroad Construction, Second Edition. By Walter Loring Webb, C.E. Bound in cloth, illustrated, 332 pages, 5 in. x 8 in. Published by John Wiley & Sons, 43 E. 19 street, New York. Price $2.50.

The scope of this book which was first brought out six years ago is well explained by its title. It includes seventeen chapters covering such matters as organization, capitalization, valuation, and volume of traffic in the first part, operating expenses, motive power, car construction, track economics, train resistance in part two, and physical elements of a railway in part three. The book is written from the standpoint of the constructing or operating engineer and deals briefly with principles and their practical application. The present edition has been thoroughly revised and the chapters on operating expenses, distance, curvature and grade have practically been rewritten.

A Handbook of English for Engineers. By Wilbur Owen Sypherd. Leather binding, 4½ in. x 6½ in., 310 pages. Published by Scott, Foresman & Co., Chicago. Price $1.50.

The author of a "Handbook of English for Engineers" has entered a new field of text-book writing. There is an abundant supply of books containing grammatical and rhetorical rules and outlining courses of study in English composition, but it is believed that this is the first attempt to prepare such a book from the standpoint of the engineer, including in it only the forms of writing of particular use to the engineer and drawing all illustrations from engineering literature. In chapter one the author discusses the planning and presentation of technical papers, and includes brief sections on paragraphs, sentences and words, illustrating good usage and common faults. Chapter two is called "Mechanical Details Common to the Various Forms of Technical Writing," and covers by rules and illustrations the subjects of abbreviation, hyphenation, punctuation, numbers and capitals. The third chapter is devoted to the writing of business letters, showing proper forms and placing especial emphasis on applications for engineering positions. In chapter four the subject of reports is treated in a similar way, and chapter five takes up articles for technical journals with numerous illustrations drawn from standard technical papers. Three appendices are included, giving rules for the preparation of manuscript and the correction of proof, examples of faulty paragraphs and sentences, lists of words frequently misused and misspelled and a bibliography of the subject. The book has been designed by the author to meet the needs particularly of advanced engineering students and young engineering graduates.

Letters to the Editor.

THE BUREAU OF RAILWAY ECONOMICS.

——, February 12, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I was very much interested in the editorial in your issue of February 7, page 235, relative to the Bureau of Railway Economics.

It happens to be my work to handle the railroad news for a large metropolitan daily. The work of the Bureau of Railway Economics came to my attention immediately after the bureau was formed. I began at once to use its reports as fast as they came out and to prepare statistical matter for them. J. M. Connell, general passenger agent of the Santa Fe, with office at Topeka, Kan., wrote me soon after the establishment of the bureau asking that I look over the bulletins and press notices sent out by the bureau, and I replied that I had already been branded as a corporation hireling for using the bureau's matter, but that I considered it invaluable if the public was to have the truth about the railways.

Then came real trouble. The managing editor shut off my publicity for the railways by saying that any mention of the Bureau of Railway Economics must be eliminated because the American Publishers' Association had decided that the matter sent out by it was in the nature of advertising and that the bureau was unwilling to pay for its publication. To pay space rates for such matter would bankrupt even the railways themselves, and the good intentions of the railways, it would seem to me, have been mistaken by the publishers of the larger dailies for an effort to get a chance to air their grievances. It seems to me as though the railways are being hit with both ends of the stick, and I for one deplore the attitude of the press in refusing to give the Bureau of Railway Economics credit for the work that it has undertaken, and which is purely educational.

RAILROAD EDITOR.

THE PRESS ON ARBITRATION OF RAILWAY WAGES.

SPRINGFIELD, Mass., February 22, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

As you have said in your editorial of this week, discussing the demands of the firemen for higher wages, the railroads have during the past few years learned some serious lessons concerning the attitude of the public. One important lesson which they have just learned, in this present crisis, is that the public press will not support them, however strong may be their position. Every editorial on the firemen's controversy—not pronounced in its prejudice toward "labor"—has either been exceedingly cautious in its support of the railways or plainly lukewarm; and with some of the dailies which are supposed to be strong and independent this lukewarmness has become positive silence. So far as my observation goes not more than one prominent paper has spoken out vigorously.

No argument could be more forcible than that which the railroads have presented in support of their objection to the Erdman law. That a difficult question, involving the weightiest financial elements, and a multitude of intricate details unfamiliar to all non-railroaders, and the decision of which is sure to bring down on the head of the decider severe criticism, ought not to be settled by one man, is too obvious to need argument. Not an editor in the country could miss the point. Yet every editorial on the subject has borne the ear marks of the hackwriter—or the coward. Each writer saw what ought to be said but carefully avoided saying it; or else said it so faintly that the effect was as bad as though he had kept silent.

Railway employees have got wage increases for the past ten years by the splitting of differences; and they do not intend to give up that soft thing. The real trouble in the present situation is that, in the engineman's case in 1912, Reason decided that on most of the big roads an increase in pay was not deserved. If Reason is going to thus side with the bloated bondholder, the firemen want nothing to do with it!

The press bases its views on reason, but the writers seem unable to forget that their main affections must be showered on "labor," morning, noon and night. *The Republican,* of this city, usually fair and independent, did not find its voice to condemn the Erdman law until after the firemen had won their contention. Condemning the railroads for their misbehavior toward the public has become such a habit that to do them justice comes very hard. These same editors, who accept the firemen's contention that arbitration is the thing and the number of arbitrators a mere detail, have no trouble in discerning the foolishness of Congress in other matters; and yet the Erdman act is only a typical example of the half baked measures that the House of Representatives is hatching up at every session.

The sole arbitrator of the firemen's case will have a perplexing task, at best; but it is to be hoped that for once we may have the question of wages in train service thrashed out on the basis of actual conditions and pure reason, with the "weight" of cowardly and incompetent railway officers on the one hand, and of unprincipled labor advocates on the other, entirely eliminated.

G. E. A.

NEEDED—A DEFLECTABLE HEADLIGHT.

NEW YORK, February 13, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

That rigid headlights on locomotives are unsatisfactory on curves has long been known. They throw the light where it is not needed and leave the track ahead in darkness. This defect was emphasized a short time ago in causing the loss of a man's life. On his way home at night he dodged a train, and stepped into a frog which, according to the report, was located on a sharp curve; he was unable to withdraw his foot in time to escape a second train.

No doubt if the man had observed the rules of the company concerning trespassing he would not have been there, but the fact nevertheless remains that an easily controlled, deflectable headlight that would throw light straight ahead when in its normal position and to either side, at the will of the engineer, is highly desirable. It is believed that automobiles will soon be fitted with lights of this kind and that its use may be extended to the locomotive. To design and build such a contrivance would surely be simple.

W. F. SCHAPHORST.

ECONOMY OF LOCOMOTIVES.

BOSTON, Mass., February 15, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The account given of German locomotive performance by Mr. Jacobs in a recent issue of the *Railway Age Gazette* (January 3, 1913, page 26) almost makes one feel that Mr. Brandeis may not have been so far off when he said that the railroads of this country could save $300,000,000 a year by intelligent effort. I refer to the coal consumptions per mile, which he gave, for different kinds of service. The trouble with this kind of statistics is that they are too general and are not based on any unit of work. The question is whether the German locomotives are worked as hard as ours and whether they are more carefully fired and operated.

If one studies the results of the tests of locomotives at the St. Louis Exhibition and on the testing plant of the Pennsylvania Railroad at Altoona, it is evident that the results are so good that they can scarcely be better in Germany. The steam used per indicated horse power per hour by the Atlantic type locomotive tested recently at Altoona is wonderfully small, and the evaporations per pound of coal of this and the locomotives tested at St. Louis were high, and unsurpassed. These two factors together make the economy, and the question is can

German locomotives do any better. I do not think they can. The cause of their economy must then be due to gentle handling on the part of the engineer, care in firing, and working more nearly at the economical point of cut-off. It is possible to work a locomotive so hard when starting and climbing grades that the exhaust will eject enormous quantities of coal from the stack; and all of our road beds are black with coal. In this country, as I understand it, it is considered more economical, in total cost of haulage, to operate a locomotive as above indicated rather than to operate the locomotive itself economically. It would be very interesting if Mr. Jacobs could get his German figures into such shape that they could be compared with American figures on a unit of work basis. F. W. Dean.

TENDER DERAILMENTS.

Stamps, Ark., February 3, 1913.

To the Editor of the Railway Age Gazette:

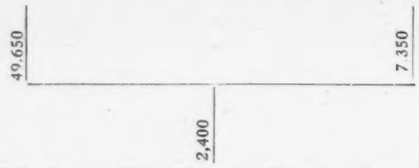
In the *Railway Age Gazette* of January 31, page 209, "G. E." states: "Since the tender frame and truck bolsters are held in the same relative positions, notwithstanding the location of the side bearings, it is difficult to see how the spacing of them can have any effect on tender derailments. The thousands of six-wheel trucks and of recent four-wheel trucks for steel cars, having side bearings far outside the journals, carrying loads with high centers of gravity, have reputations for safety which cannot be assailed."

The conclusion that the reputation for safety of trucks under passenger equipment with widely spaced side bearings, "cannot be assailed" is not convincing. If it is conceded that such trucks are the least likely to derail of any known, it does not necessarily follow that their safety is because of widely spaced side bearings, but rather in spite of it. Years of accumulated experience condemn widely spaced side bearings when in combination with a short truck wheelbase and insufficient truck spring capacity. The writer believes the disinclination of the passenger truck to derail is primarily due to its long wheel base, which is effective in resisting a tendency of the truck to rotate in a horizontal plane, as more fully explained hereafter. Moreover, the center of gravity of a passenger car is lower ordinarily than that of either a tender or a loaded box car.

Referring to the remarks of Prof. Moore on the Westport wreck. His analysis of the vertical forces in a plane at right angles to the track is very interesting. A similar investigation of the forces in a horizontal plane parallel to the track, at the instant the vertical forces were as indicated in Fig. 6, will shed further light upon the subject. The energy of the train may be expressed as:

$$E=66.827\ V^2,$$

in which E is the energy in foot-pounds per ton and V the speed in miles per hour. Solving for E, with V at 48 miles an hour, we have for the energy per ton, 153,969 ft.-lbs. If the train resistance is, say, 6 lbs. per ton, and no other resistances are to be overcome by the energy of the train, it will run a distance of 25,344 ft. before coming to a stop. Dividing 153,969 ft.-lbs. by 25,344 ft., we have 6 lbs. as the constant force whose point of application is at the center plate, and which is the required force to overcome the resistance of the train. If the vertical reactions of all the wheels in the train on the left side are equal to those on the right side, with the exception of the one truck under consideration—the reactions of this truck being as above referred to (Fig. 6)—the forces are as shown below, for a train of 400 tons:



The 2,400-lb. force will tend to produce rotation of the truck in a horizontal plane parallel with the track, and about a point near the force of 49,650 lbs. In other words, the truck is certain to be slewed, and consequently derailed. For the force of 2,400 lbs. to produce no rotation in a horizontal plane, the vertical reactions (weights on the wheels) must be equal. When the weight of the car is carried on the center plate, this occurs, and it is the normal condition; but when the car body is rocking, the weight is alternately carried on the center plate and one side bearing, and on the center plate and the other side bearing. The farther the side bearings are spaced from the center plate, the greater the vertical reaction on that side for any given load and oscillation. With the weight carried on the center plate only, the reactions are equal, and the momentum of the car, acting through the center pin, is distributed in equal halves to each side; but when the car rocks, unequal vertical reactions occur; i. e., more weight is momentarily carried on one side than on the other. The greater the difference in the reactions, the greater is the tendency for the truck to slew.

This has often been demonstrated in the actual handling of cars which have been derailed by reason of the load being placed on one side of the car. The principle can also be demonstrated experimentally, and in the writer's opinion it is the cause of the great majority of our derailments. F. W. Green,
General Manager, Louisiana & Arkansas.

UNREASONABLE FACILITIES.

London, England, January 27, 1913.

To the Editor of the Railway Age Gazette:

I see that the Colorado Supreme Court has compelled the Colorado & Southern to continue to operate an unprofitable line, holding that the law imposes on the carrier "the duty of furnishing facilities to the public on its entire system, not a part," and that, having once undertaken to serve the public, a railway cannot abandon an unprofitable portion of its business without surrendering its charter.

What the precise wording of the statute under which the Colorado court proceeded, I have no means of knowing. But, on the assumption that the Colorado statute, like the act to regulate commerce, is founded upon our English act of 1854, and requires railway companies to afford to the public "*reasonable* facilities," the decision of the English courts is even more relevant than the action of the Mexican government (commented on in the *Railway Age Gazette*, p. 89) and may interest your readers.

Our railway commission in 1891 in the Winsford case took the same line as the Colorado court, and held that under the act of 1854, "if a railway company carry passengers at all, it must afford such facilities for them as are reasonable over the whole extent of their system. . . . The effect of the act is to deprive railway companies which have commenced a particular traffic of the power, which they previously had, of continuing or discontinuing it at their own discretion. . . . The fact that a branch does not yield a profit over working expenses does not afford a reason why it should not be worked." Three years later in the Darlaston case the same point came up. A company had discontinued passenger service and closed a station, because the bulk of the traffic had been diverted by a tramway, and they were losing money. The commissioners again ordered the station to be reopened and passenger traffic resumed; though they stated in their judgment "It is but too plain that the line must be worked at a loss, and we regret to impose this burden upon the defendants." The case was taken to the Court of Appeals, and the judgment of the commissioners reversed. Reasonable facilities, said that court, must be "reasonable as regards the company as well as the public": "to require a railway company to give facilities to the public which involve a heavy loss on themselves . . . seems to me to disregard the plain language of the act, and to assume a jurisdiction to compel a railway company to give unreasonable facilities which is contrary to the terms of the act.

And this is how the law in England stands today.

W. M. Acworth.

ATTRACTIVE STATIONS FOR SMALL TOWNS.

New Passenger Facilities Provided at Five Points on the Buffalo, Rochester & Pittsburgh—Two General Standards.

The Buffalo, Rochester & Pittsburgh has built a number of stations in small towns and villages along its line for which two standard designs applicable to most locations have been worked out. The five stations recently built at Ridgway, Pa., and at Scottsville, Mumford, Springville and Orchard Park, N. Y., are typical of this form of construction. The class A station is 99 ft. 8 in. long, the main portion of the building being 28 ft. wide, and the baggage room end 26 ft. wide. There are separate waiting rooms for men and women, each of these being 23 ft. 11 in. x 25 ft. 10 in. in size. Settees are provided around the walls and drinking fountains are furnished in both rooms. The waiting rooms are connected by a broad corridor, one side of which leads to the main entrance in the rear of the building and the other faces the ticket windows. A train order room opening off the ticket office and a parcel room, which is included in the baggage room, are also provided. The class B station is 28 ft. x 67 ft. 8 in. over all, having a single waiting room and a freight room as shown in the accompanying floor plan. The Orchard Park station is a modification of the class A plan, being shortened to 73 ft. 8 in. by reducing the waiting rooms to 20 ft. 1½ in., and the baggage room to 14 ft. A broad porte cochere has been provided at this station and a long shelter covers the platform. The other details of the building are similar to the standard class A station.

Track Side of Class A Station at Ridgway, Pa.

Rear of Class A Station at Springville, N. Y.

at 8.7 in. Or the radial stay at 13.1 in. was on a par with the Jacobs-Shupert at 15.8 in.

If this were to hold it might mean that, while boiler efficiencies were the same, there would be a great reduction in engine efficiency as a direct result because of the increase of back pressure required to maintain the heavy draft.

Taking the results purely on the basis of draft and constructing diagrams using the draft in inches for abscissae, and evaporation per pound of coal fired for ordinates, we obtain a diagram that confirms Dr. Goss' conclusion that was quoted. Such a diagram is shown in Fig. 2. From this we see that the rate of firing with the Jacobs-Shupert boiler was less than with the radial stay on the basis of draft. Hence it is but natural that,

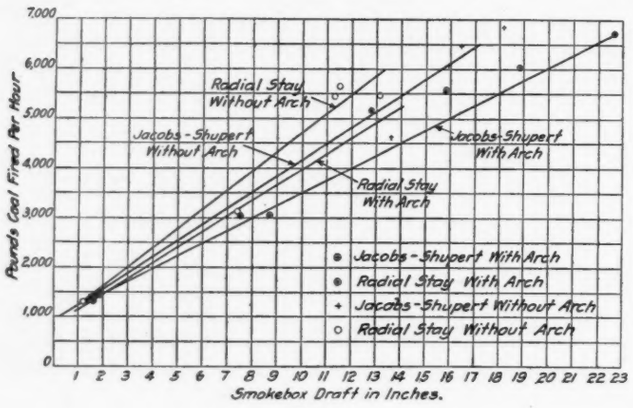


Fig. 2.

given more coal, the radial stay boiler should show a higher rate of evaporation with the same draft, as tested, than does the Jacobs-Shupert.

There is another point, minor and insignificant to be sure, that was ignored in the construction of diagram, Fig. 1; and that was the fact that, in all computations involving heating surface, it was the *developed* surface that was used (see Dr. Goss' report, page 42). As the Jacobs-Shupert boiler contained about 0.8 per cent. more total heating surface than the radial stay boiler, this tends to lower its line in the diagram of evaporation per square foot of heating surface.

But if we assume that the rate of evaporation is proportional

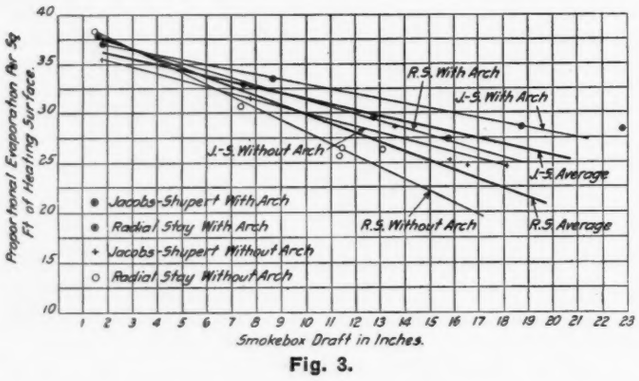


Fig. 3.

to the amount of coal burned, and that the efficiency of the two boilers under the varying conditions of draft remains as given in the report, we may construct a diagram like that shown in Fig. 3. In this the rate of evaporation per square foot of projected heating surface has been divided by the amount of coal burned per hour, and the quotients used as ordinates, with the draft in inches for the abscissae as before. This shows that the radial stay boiler was the more economical at low rates of draft, up to about 5.8 in., and that, thereafter, the Jacobs-Shupert boiler was the more economical; that is, gave a higher rate of evaporation, which is in exact accord with Dr. Goss' assertion reached by an entirely different route. This is given merely to call attention to the criticism that has been pretty extensively made, and to show that the diagram of Fig. 1 can only be considered when all of the modifying conditions are taken into account; in short, that, when taken by itself, it may give an entirely erroneous idea of the work of the two boilers.

CHROME-VANADIUM TENDER WHEELS.

For a number of years the Vandalia Railroad has been keeping comparative service records of chrome-vanadium and carbon steel wheels used under passenger tenders, which carry 7,500 gal. of water and 12 tons of coal, making an average load of each wheel on the rail of 17,875 lbs. when the tender is loaded. The average results show that about two and a half times as much mileage was obtained from the chrome-vanadium wheels per unit of wear and turning as from the carbon steel wheels. A summary of these records for 3½ years' service, up to June, 1912, is shown in the table.

Summary of Comparative Service Tests of Chrome-Vanadium and Carbon Steel Tender Wheels.

	Chrome-vanadium tender wheels.	Carbon steel tender wheels.	Per cent. in favor of chrome-vanadium wheels.
Coal capacity, tender, tons	12	12	...
Water capacity, tender, gals	7,500	7,500	...
Weight of tender in working order, lbs.	143,000	143,000	...
Average load per wheel on rail, lbs.	17,875	17,875	...
Class of service	Passenger	Passenger	...
Average mileage per 1/16 in. diam wear.	12,857	12,857	39
Average mileage per 1/16 in. diam. wear and turning	6,137	2,427	152
Maximum mileage per 1/16 in. diam. wear and turning	6,894	3,344	105
Minimum mileage per 1/16 in. diam. wear and turning	5,536	1,294	327

From the results thus far obtained the Vandalia has drawn the following conclusions as to the relative advantages of the chrome-vanadium wheels. The material is more uniform and a greater mileage is obtained per unit of wear; this results directly in less flange wear and a smaller amount of material wasted in turning the wheels in the lathe, with a consequent greater mileage per unit of wear plus turning. There is an entire absence of shelled or burned spots in the treads, as compared with the carbon steel wheels.

The results cover 10 mated pairs of carbon and 16 mated pairs of chrome-vanadium solid steel wheels. Contour charts were made of each wheel before and after each turning. The large amount of material removed in turning the carbon steel wheels was due in some instances to the wheels shelling or being burned. Up to the present time the chrome-vanadium wheels under observation have made over 300,000 miles, and it is expected that they will probably reach 400,000 miles. No trouble has been experienced in machining the chrome-vanadium wheels in a truck wheel lathe at a cutting speed of 15 ft. per minute.

Research work since the Vandalia wheels were placed in service has resulted in a new method of heat treatment. The wheel is heated to a certain temperature and is then spinned for a pre-determined length of time in a trough of water, with the tread immersed to a little below the limit of wear line of the wheel. It is then taken out and allowed to cool in the air, after which it is reheated for annealing. In this way the plate and hub are not affected by the immersion of the ring in the water, but undergo an annealing operation while the rim is being hardened. This results in a somewhat higher and more uniform hardness across the rim than is to be found in the wheels now in service on the Vandalia.

New Line for Brazil.—The government of the State of Minas, Brazil, has signed a contract with Col. José Caetano Pimentel for the construction and operation for 50 years of a railway to run from the Doce river, near the Bueno Brandao colony, to Urucu station on the Bahia-Minas Railway.

LATEST ASPECTS OF THE "SAFETY FIRST" MOVEMENT.

Valuable Experiences and Lessons in Machine-Shop Safety, and Instructive Conclusions Concerning Discipline of Employees.

Two recent papers on "safety first" were by two of the best-informed and best qualified men now at work in that department of the railroad service, and we give below liberal extracts from their papers. The first was read at the New York Railroad Club, February 21, and the other at the Western Railway Club, Chicago, February 18.

J. W. COON'S PAPER.

J. W. Coon, assistant to the general manager of the Baltimore & Ohio, in speaking on "Safety on the Railroads," said:

Everyone who has studied the question of preserving human life on railroads will agree that there are ample rules and instructions in effect and that they are clearly drawn. It is impossible to correct present evils simply by securing greater alertness on the part of the officers or by originating additional rules. The great majority of railroad men are careful and competent. The mistakes are made by the few, but we must work with all, for we do not know the few who will cause the trouble.

Before a physician will give the patient medicine he must know where the trouble is. So in safety work. Before you can apply a remedy, you must know your weakest division, your poorest shop, yard, etc. General letters stating that personal injuries are increasing and something must be done will do about as much good as to attempt to persuade a healthy country boy on some hot Saturday afternoon that it is more pleasant to study his geography lesson than to visit the old swimming hole. You must be able to say to a given shop, "you are making the poorest showing on the system"; "your yard is making the poorest showing"; "your division is the last on the list," etc. To be able to do this, we keep a record of injuries to employees by shops, yards, divisions, etc.

Their standing was first figured on a basis of the number of employees. We found, however, that this was not exactly fair. To illustrate—a shop normally has one thousand men; business drops off and the allotment is cut. The master mechanic very naturally and properly endeavors to keep his organization together, and therefore reduces the number of hours worked per day, or works but five days a week. The danger of injury, in this case, would only be half as great, yet the number of employees would remain practically the same, and the shop would be making a good showing. We therefore figure the standing of each division, yard, shop, etc., by dividing the total wages earned by the number of injuries. Then if business falls off the wages will do so in a corresponding measure. In this way we can tell at a glance the point making the poorest showing.

The suggestions made by the local committeemen should be given every consideration. The division making the best showing will always be the one on which the superintendent and other local officers take personal interest in the work and follow out as many of the suggestions as possible. The superintendent is influenced by the interest displayed by his superior, so that it is essential that from the president down personal interest be taken by all the officers.

We have covered over 1,500 machines in the shops. We have put walkways on many bridges, especially where located near switches. Moved buildings and poles back to give clearances. Raised the hand railing on caboose cars as men have been jerked over the low ones, etc. All at the suggestion of the men. The men will take about the same interest they see the company taking. More essential even than to locate the sore is to ascertain what caused it. If your fatal injuries are due to train accidents you must give the problem special attention. Ascertain whether it is due to track, equipment or men.

We found, in carefully analyzing the fatal injuries to employees during the past year, that over 90 per cent. were due to causes that no expenditure of money in providing additional safeguards, etc., could possibly have prevented. They were due to failure of the human element. I do not say they resulted from carelessness; some were due to thoughtlessness, some to lack of familiarity with the movements and some to carelessness, even though possibly this was caused by over zealousness on the part of the employee in trying to do the work in too much haste.

Only 19 per cent. of all employees fatally injured in the past year were killed in train accidents, and this includes all the minor accidents, such as cars sidewiped in the yards, striking cars too hard, etc., and not entirely due to collisions or derailments, as many think; in other words, over 80 per cent. were fatally injured in other than train accidents.

It is sometimes said that men have to run by signals, on rainy or foggy nights, without being sure of their position; that otherwise they would be taken off the preferred run, or at least, criticized. I have been in the operating department of this road for twenty-five years, and have never yet known of an engineer being censured where he could not make time because of fog or extremely stormy weather. Often a message is sent an engineer asking the cause of the delay. Some might consider this as a criticism. It is not. It is necessary to make report of every delay, and it is to enable a local officer to do this that the message is sent. President Willard has said to every officer and employee that safety is to be the first consideration, comfort of passengers next and speed or punctuality last. We had had no accident to bring out this talk. He was merely outlining his policy to be followed by all. A copy of this talk was sent to each employee in the service.

We post on bulletin boards over the entire 6,000 miles of road, within two or three days of its occurrence, the cause of any fatal injury, and caution our men to avoid a similar accident. The monthly employees' magazine is read by our 60,000 employees. We carry on observation tests—sometimes improperly called "surprise tests." This work is the greatest aid in safety. Each division is required to make not less than a given number of tests. For example, a clearance card is made to show the wrong engine number or incorrect date to see if the crew are alert and detect these errors. A train order is improperly repeated to see if the despatcher or operator is vigilant. A signal light is removed or a signal improperly displayed to see if the rules requiring train to stop under those circumstances are observed. These are not "surprise" tests; they are limited to conditions met with every day and no "catch" features are permitted. These tests should be diversified—should be made with every employee in train service and a careful record should be kept. If an engineer fails he should be given another test of a different nature and this followed up to see if he profited by the lesson. If habitually careless he should not remain in train service. The value of these tests cannot be over-estimated. In fact I would advocate the appointment of one or more men, thoroughly familiar with railroad operation, whose business it would be to see that these tests were properly made, proper record kept and failures followed up. Let the inspector get on a freight train and ask the brakeman under what orders he is running to see if he goes over the train orders and is fully informed. Let him examine the lanterns to see if torpedoes are attached, that they are clean and ready for instant use. Let him talk to the men as to what constitutes proper flagging, etc.

For five years on the Baltimore & Ohio we have not killed a single passenger in a train accident, and during that time we have carried 85,000,000. We want the employees to be equally

careful in their shop, yard or track work, where passengers are not involved. . . .

GEORGE BRADSHAW'S PAPER.

George Bradshaw, general safety agent of the New York Central Lines, in speaking before the Western Railway Club said:

Railroad men have always known that unsafe conditions and practices should be corrected, but the problem has been to find an effective way of correcting them and keeping them corrected. The public have been trying to find a way of doing this apparently simple thing for the last thirty years by the enactment of laws. Yet, every year the personal injury record among employees has been growing worse. The doctor has been giving us the wrong medicine.

Safety committees composed of officers and employees—whose duties are to discover and correct unsafe conditions and practices—now exist on almost 200,000 miles of railroad in the United States. The man who first conceived the idea is R. C. Richards of the Chicago & North Western. The most difficult thing in the world to find is a new thought. Mr. Richards belongs to that small class of great men who have originated ideas: and in future years railroad men the country over will honor him for the service he has rendered.

The New York Central took up safety work as a distinct branch of the service about two and a half years ago. It now has 60 division and shop committees comprising about 900 members, over a territory of about 12,000 miles. We began this work in the shops, where attention was chiefly directed to the guarding of machines. To do this is by no means an easy task. It requires general knowledge of machine operation, and familiarity with personal injury records covering varied and extensive conditions. The proper time and place to guard a machine is when the machine is being built and the man who should guard it is the man who made it. Our factory laws permit manufacturers to construct and distribute machines without giving any consideration whatever to safeguards, and then after machines have been distributed all over the country and perhaps put into use without safeguards, state inspectors are employed to ferret the machines out and have them guarded at the expense of the users. Wood is proper for covers, walk-ways and railings, but generally speaking should not be applied to machines or used to enclose parts of machines. Pipe railing may be used in front of switchboards, about pits, and around flywheels and pulleys in engine rooms where only those in charge have occasion to go. It should not be used for guarding flywheels and pulleys in shops. Woven wire is preferable for flywheels, pulleys and large gears because it allows free circulation of light and air, and permits a view at all times of movable parts of machine. It is also more easily and cheaply applied than heavy sheet metal. Wire not less than ⅛ in. diameter, with mesh not greater than 1 in., should be used. Smoke stack netting or expanded metal serves the purpose.

Safeguards for machines must not interfere with the operation of machine or inconvenience the operator; they should, as far as possible, be automatic so that their efficiency does not depend upon their being properly adjusted. They should be strong and firmly attached. Ordinarily a space of not less than 6 in. should be left between guard and floor to permit sweeping. They should be attached to the machine, floor, or other support so that they cannot be set aside. Doors or slides should close automatically where necessary.

It is seldom advisable to purchase patent safeguards, because a large percentage of such safeguards are not practicable. In almost every shop there is considerable scrap material which may be used to good advantage in the construction of guards and the very fact that guards are being made and applied in the shop is in itself an object lesson in safety.

We have prepared and put into effect standard specifications for safety devices. These specifications, illustrated by photographs and drawings, are printed in portfolio form and distributed to all officers having anything to do with machinery. These specifications have been developed as a result of experience in the construction of safeguards for many machines in various shops during the last three years. Many guards applied when this work was first begun, we have found as the result of further study to be not fully protective, unnecessarily expensive, or otherwise objectionable. We have, therefore, taken those guards which experience has shown to be the most effective, practicable and economical, and made them standard for all shops.

Mr. Bradshaw showed his audience a large number of pictures illustrating his statements. In one picture, for example, a guard covered only the upper part of some gears, leaving the lower portion exposed. An employee was caught and injured; and the exposed portion of the gears has since been enclosed. Other pictures showed a number of safeguards constructed according to the new standard specifications. In many of these woven wire was the principal material. In a woven wire guard for gears at the end of a lathe, the guard is attached to the machine by hinges in such a manner that it swings shut of its own accord. A careless employee cannot leave the guard out of its proper position.

The conditions corrected by safety committees do not as a rule involve a great deal of expense.

Unsafe conditions are not responsible for the greater number of preventable injuries. The record for two years shows that from 60 to 70 per cent. of the accidents which could have been avoided were due to unsafe practices on the part of employees. We do not make proper and sufficient investigation of the moral and mental qualification of the men we employ in the more responsible branches of the service. Under the system now prevailing on most roads, almost any man of prescribed age who can pass a physical examination can get a responsible position. In nine cases out of ten, we take the references given by the applicant, write them formal letters of inquiry and the butcher and the barber, the teamster and the trader do the rest. The duty of employing new men is generally delegated by officers to assistants, and by them further delegated down the line till it often happens that a clerk is the only one, other than the examining physician, who sees or knows anything about the applicant before he reports for duty.

Instead of this method, there should be on every road, a central employment bureau with branches at important points which should have sole authority in the employment of men. This bureau should encourage—if necessary should advertise for—applicants and should make a careful and thorough investigation of the antecedents and of the personal record of every applicant. We could and we should have in charge of our trains the finest body of men in the world. The work is attractive, even fascinating, the pay is good and the chances for advancement encouraging. The most popular toy in the world for boys is an engine and string of cars, and when these boys grow up, they all want to go railroading. We don't need them all, but we could, if we went about it in the right way, select the best of them. When a capable country boy comes timidly into a railroad office today and applies for a job, if we don't happen to need men at the time, the employing officer, or more likely his clerk says, "Can't do anything for you now." The boy goes away and gets a job clerking at ten dollars a week. A few months later there is a rush of business and we need men, but we have no waiting list—we don't even take names and addresses of applicants, and consequently we have to take anything we can get on short notice, and that often means the boomer and the loafer. Even this method wouldn't be so objectionable, if we gave every new man a careful and thorough training before allowing him to go to work, but we don't do that; that is, we don't carry it far enough.

It should be borne in mind that the attitude of the yardmaster and the roundhouse foreman toward the Safety Movement, being observed and understood by individual employees, is often more potent than that of the general manager, whose views are known by employees only in a general and indefinite way. If the yardmaster is permitted to remain indifferent to the necessity for

compliance with instructions, their enforcement will be difficult and to a great extent impossible.

Mr. Bradshaw showed copies of numerous pamphlets which have been issued by him as circulars among the employees. He finds that employees are glad to receive this literature and that they read it attentively. He has almost completed a "Safety Exhibit Car" which will contain models of approved safety devices, safety literature, photographs and other things of interest. This car, in charge of a competent man, will be exhibited at all important points where employees will be given an opportunity to see what is being done for the prevention of injuries. Every employee on the system will be required to visit the car.

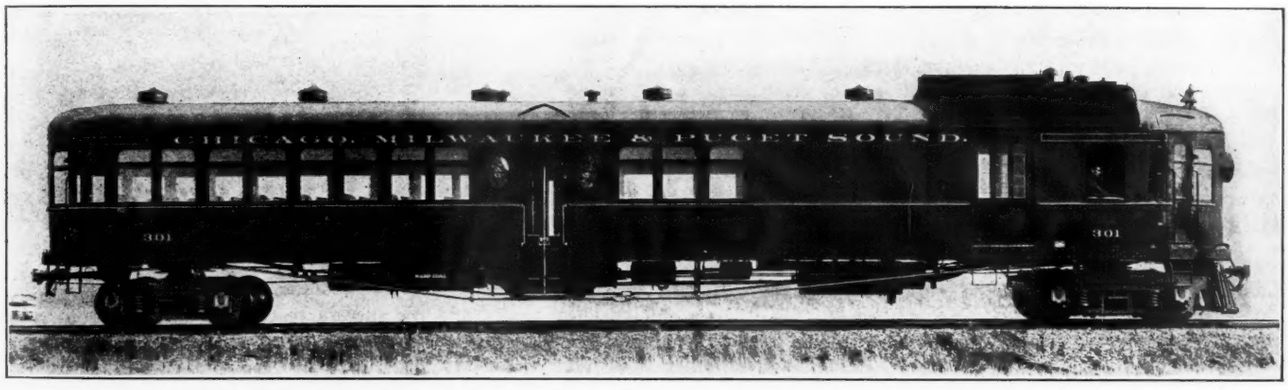
MOTOR CARS ON CHICAGO, MILWAUKEE & PUGET SOUND.

The Chicago, Milwaukee & Puget Sound has recently placed in service on branch lines in the state of Washington, two General Electric Company gas-electric motor cars. One of these is operating between Everett and Monroe, a distance of 14 miles, and makes five single trips a day, totaling 70 miles; while the other runs from Seattle, via Cedar Falls to Enumclaw, a distance of 62 miles, and makes one round trip each day, covering 124 miles.

The cars are of the combination passenger, smoking and baggage compartment type, with turtle back roof. They are 70 ft. 5 in. long, 10 ft. 5 in. wide, weigh approximately 50 tons, and have a total seating capacity for 77 people. The cab, containing the power plant apparatus, measures 11 ft. 11 in. long; next is the baggage room, 15 ft. long; then the smoking section, 10 ft. 11 in. long; and the passenger compartment, 27 ft. 5 in. long. A center vestibule with side entrance runs crosswise between the passenger and smoking compartments. The smoking section provides for 20, and the passenger compartment for 57 people. All-steel construction is used throughout, except in the case of the interior finish, which is of mahogany.

The generating unit is located above the floor line of the cab, where it is under the immediate observation of the engineer. It consists of an eight-cylinder, four-cycle gas engine of the "V" type, direct connected to a 600 volt, commutating pole, electric generator, designed to meet the special conditions the service demands. The engine can rotate at normal speed, irrespective of the speed of the car, which is started by compressed air taken from the main reservoirs of the air brake system, which are built with surplus capacity for this purpose. The main air compressor is driven from the crank shaft of the main engine, and is fitted with an automatic governor to maintain a constant pressure. An auxiliary equipment is also provided, consisting of a two-cylinder, four-cycle gas engine, direct connected to a single cylinder air compressor and lighting generator. The function of this set, which is started by hand, is to supply an initial charge of air for starting the main engine and in addition to deliver power for lighting the car.

The control is similar to that of any standard electric trolley car. Mounted on the axles of the forward truck are two GE-205, 600 volt, commutating pole railway motors of 100 horse power each, which by means of a special controller, are placed progressively in series and parallel connection. Two extra points are provided on the controller for final speed acceleration in parallel, whereby the motor fields are shunted and weakened. The resulting higher armature speeds permit the use of smaller pinions, and full utilization of the power input is secured throughout the entire speed range, from start to full speed. Energy is transmitted directly without the intervention of mechanical change speed gearing. The voltage is governed by varying the strength of the generator field by the movement of a single handle on the controller, and the resultant speed changes of the motors produce a smooth and rapid acceleration. Separate handles are provided for throttling the engine and for reversing the car. The latter is accomplished by changing the motor connections in the usual manner without stopping the engine, which always rotates in the same direction. This allows the car to be brought to a halt quickly, independent of the brakes in an emergency. The radiators are placed on the roof and circulation for cooling the engine is maintained by the thermo-siphon system.



Gas-Electric Motor Car for Branch Line Service.

The trucks are of the swing bolster type. The brake equipment includes hand brakes in addition to the combined straight and automatic air brakes. A high power Mazda incandescent headlight and reflector are provided and a hot water heater, coal fired, is installed for heating the car. A 150-gallon gasolene tank for the power supply is suspended under the car. While the engine is running the gasolene is pumped automatically, and when starting, by a hand pump.

These cars made the trip across the continent under their own power. Car 300 left Chicago on the Chicago, Milwaukee & Puget Sound tracks and covered the distance to Tacoma, Wash., 2201.2 miles, in ten days, daylight running. Necessarily, the special schedules of the motor cars while on the trip were subject to the exigencies of regular traffic requirements and numerous delays were encountered. The car in question averaged 220 miles a day, and on one day covered 315 miles. A run from Malden to Othello, Wash., 103 miles, was made in 2 hours 10 minutes, and in one case 20 miles of 2.2 per cent. grade were negotiated in 56 minutes with one stop.

RAILROAD CONSTRUCTION IN THE PHILIPPINES.—During the fiscal year ended June 30, 1912, 65 miles of new line were opened to traffic in the Philippine Islands, 33 miles were graded and track was laid on 43 miles.

THE PRODUCTION OF SOUND RAIL INGOTS.

The American Institute of Mining Engineers Devoted an Entire Day to This Subject—Abstracts of Two Papers.

The sessions on February 19 of the meeting of the American Institute of Mining Engineers, held in New York, were devoted to the discussion of sound ingots for rail steel and a number of railway men participated in the discussion. Among the papers presented were two entitled "Comparative Notes on Steel Rail Rolling," by Robert W. Hunt, and "Piping and Segregation of Ingots of Steel and Ductility Tests for Open-Hearth Steel Rails," by P. H. Dudley, which are given below.

The discussion was presented under the following topics: First, Is the present method of getting rid of pipes by cropping a safe and reliable device for making sound steel? Second, Is it desirable to increase the amount of metal arbitrarily cropped off the top of an ingot, and, if so, what would be a fair excess price to pay for cropping off 20 per cent.? Third, Is it commercially practicable to make ingots without pipes or blow holes, and what additional expense of manufacture would be justified to accomplish this result? Fourth, What process for making pipeless ingots seems to promise the most commercial success, and why? The opinion was expressed by several that little piping was present in good mill practice, and it was felt that the proportion to be cropped from the top of the ingot should not be arbitrarily fixed, as that would work to the detriment of the better mills and would penalize them. The point was brought out that head failures in rails can be traced to the interior of the ingot, and that this class of failures is about 50 per cent. of the total. These failures are invariably due to segregation and are almost entirely confined to rails from the upper third of the ingot. While pipes are caused mainly by the use of silicon, titanium and aluminum, segregation is greatly reduced by them. There was considerable discussion over the use of aluminum and titanium, several men objecting strongly to aluminum.

COMPARATIVE NOTES ON STEEL RAIL ROLLING.

By Robert W. Hunt.

I have frequently stated that while the chemical composition of steel was important, even greater importance was connected with the mechanical and heat treatment of the metal. During the past year I encountered such a positive example of that fact that I deem it worth putting upon record.

A prominent railway system divided an order for open-hearth steel rails between two steel works, both of which are under the control of the same corporation, giving to one about 18,000 tons, and to the other 7,500 tons of the same section and to be made under the same specifications. The rolling results obtained in the two mills varied so widely that a study of the figures is intensely interesting and serves to illustrate the advantages obtained by careful ingot casting, and quite as pertinently the possible benefits of careful subsequent heating and rolling with moderate reductions in the rolling process. The smaller order was rolled complete in four instalments during the same months that the larger order was being made in eight separate instalments; but, to permit of exact comparisons, the totals of the four instalments (completing the order with the mill which I will call A) are given with the totals of the first four instalments of the larger order, made by the mill designated as B. These rolling results are:

	Mill A.	Mill B.
Number of rollings	4	4
Total number of rails rolled	18,278	27,832
Percentage of rails cut to short length because of flaws near ends, etc.	0.7	7.6
Percentage of rails made second quality for flaws, etc.	0.9	6.3
Percentage of rails scrapped for flaws, etc.	0.6	4.5
Percentage of rails scrapped for failure at drop test	None	3.4

It should be stated that the above figures cover all the reasons for putting the rails in the classes stated. Thus a part of the percentage of rails cut to short lengths may have been because of bad drilling or bad sawing. Such classification, however, in this case is entirely proper, as neither mill suffered from unusual or abnormal difficulties in any way, and the figures indicate ordinary performance uninfluenced by unusual errors of either workmanship or mechanical troubles in rolling.

Emphasis should be laid on the fact that both mills were working to exactly the same specifications, and producing a section which has been in use for several years and in large tonnage. It is an 85 lb. section having 36.7 per cent. of the metal in the head, 22.2 per cent. in the web, and 41 per cent. in the base, being, therefore, well proportioned for the avoiding of torn flanges or other rolling difficulties, sometimes encountered with sections having thin flanges.

The chemical composition and drop-test specified with the average results obtained, were

	Specified.	Average Obtained. Mill A.	Mill B.
Carbon, per cent	.55 —.70	.60	.61
Phosphorus, per cent., not over	.045	.023	.023
Manganese, per cent.,	.65 —.95	.83	.74
Silicon, per cent	.075—.18	.13	.14
Sulphur, per cent., not over	.055	.029	.039

	Specified Min.	Specified Max.	Obtained Mill A Min.	Obtained Mill A Max.	Obtained Mill B Min.	Obtained Mill B Max.
Deflection on 4 ft. supports with 2,000 lb. tup falling 20 ft.	1.75 in.	3.25 in.	2.3 in.	3.2 in.	2.2 in.	3.8 in.
Average deflection			2.7 in.		2.8 in.	

	Mill A.	Mill B.
Number test pieces breaking on first blow	0	9
Number test pieces showing pipe or segregation when nicked and broken	3	9
Number heats rejected because of two pieces failing at drop test	0	2
Number heats rejected for exceeding deflection limits at drop test	0	4
Number heats rolled	119	173

Both mills took advantage of the full range permitted in the chemical limits, and the success reached in obtaining consistent carbon results is shown by the table below.

Permitted Carbon: Per cent.	.55	.56	.57	.58	.59	.60	.61	.62	.63	.64	.65	.66	.67	.68	.69	.70	Total Heats
Number of Heats:																	
Mill A.	..	1	2	4	5	17	17	14	13	14	11	8	9	4	..	..	119
Mill B.	20	8	9	14	12	16	14	14	14	15	7	7	10	6	6	1	173

It will be noted that Mill A's results were more consistent than B's.

The chemical compositions obtained at the two mills agree so closely that some other reason must be sought to explain the divergent physical results obtained in the product, and, therefore, data on the actual performance of the mill operations is important. The principal items are:

	Mill A.	Mill B.
Number of furnaces making the steel	6	27
Average size heats cast	196,000 lbs.	183,500 lbs.
Maximum weight heats cast	214,000 lbs.	220,000 lbs.
Minimum weight heats cast	128,000 lbs.	155,000 lbs.
Average time metal held in ladle before casting	4 min.	3½ min.
Maximum time metal held in ladle before casting	11 min.	52 min.
Minimum time metal held in ladle before casting	1 min.	2 min.
Average number of ingots per heat	20	23
Maximum number of ingots per heat	22	28
Minimum number of ingots per heat	13	20
Average time between casting and stripping	43 min.	1 hr. 7 min.
Maximum time between casting and stripping	2 hr. 15 min.	5 hr. 55 min.
Minimum time between casting and stripping	24 min.	15 min.
Average time between stripping and charging in soaking pits	16 min.	46 min.
Maximum time between stripping and charging in soaking pits	1 hr. 6 min.	11 hrs.
Minimum time between stripping and charging in soaking pits	3 min.	10 min.
Average time between charging in soaking pits and blooming	2 hr. 20 min.	2 hr. 47 min.

	Mill A.	Mill B.
Maximum time between charging in soaking pits and blooming	4 hr. 30 min. *b*	6 hr. 5 min. *a*
Minimum time between charging in soaking pits and blooming	1 hr. 30 min.	1 hr. 0 min.
Number of cold heats charges	8	None
Per cent. top discard	10 to 13	10 to 12
Time in reheating furnaces	20—50 min.	None *c*
Average weight ingots	9,740 lbs.	7,970 lbs.
Size of ingots	22 in. x 26 in.	20 in. x 24 in.
Number passes in blooming mill	21 to 25	9
Size of bloom produced	7 x 9	8 x 8
Number passes in rail mill	11	9
Total passes	32 to 36	18

a One heat in pits 24 hrs.
b One heat in pits 25 hrs.
c Mill B rolls direct, does not reheat.

It will be especially noticed that both mills were casting large heats, approximating 85 tons. These were made by almost identical methods, using the usual scrap and pig iron process, the iron being taken from mixers as required, and varying in proportion to the scrap used. As far as possible at both mills, this mixer metal was used for recarbonizing in the furnace, but many heats had coke or coal added to the ladle on tapping, in addition to the usual ferro-manganese and ferro-silicon. While the heats at mill A were slightly larger than at B, the difference is not of importance, but it is pertinent to note that there are but 6 furnaces represented at mill A as against 27 furnishing rail steel at B; and consequently, there were probably but two steel melters working at A as against at least six at B. The personal equation may, therefore, have played an important part in making the steel.

Equally noticeable is the fact that while the average for the time intervals of the various operations at the two mills is not much different, still the range between the maximum and minimum for B is consistently greater than for A. There can be but little doubt but that a delay between casting and stripping ingots and between stripping and charging in the soaking pits is likely to be seriously reflected in the soundness of the ingots, and of at least equal importance, is the necessity for teeming the steel at uniform temperature. A variation of 50 minutes in the time heats were held in the ladle prior to casting must have caused variable teeming temperatures, and produced many blowholes in some of the ingots. Admitting the presence of blowholes near the surface of the sides of the ingots, and remembering the oxidizing action in the soaking pits, it is not surprising that heavy reductions in the blooming mill had an extremely detrimental effect on the product. This is reflected, no doubt, in the large number of rails containing flaws found at mill B.

Appreciating, therefore, the probable difference in the ingots produced at the two mills and the actual difference in the blooming practice, the principal other variable existing was in the reheating of the blooms at mill A. There the ingots were cut into four blooms, which were then given a wash heat in reheating furnaces, after which they were rolled into two rails in a rail train of 11 passes. At mill B the rail train consisted of 9 passes with no reheating of the blooms.

It is interesting to note the reported history of the heats rejected at mill B. Two heats were rejected at the drop test because two of the three test pieces broke on the first blow of the tup. The steel of the first heat was reported as being somewhat low in temperature when tapped. While pouring, the nozzle froze up, and while the ingots were in the soaking pits an average of four hours and 20 minutes, they bloomed cold and rough. The second heat was quite the opposite, the tapping temperature being high, and while casting the stopper head was finally lost, but the heating and the blooming were normal.

Analysis of rejected heats gave:

C	P	Mn	Sil.	S	Remarks
.70	.015	.74	.11	.034	Two pieces broke
.57	.020	.65	.08	.035	Two pieces broke
.55	.014	.65	.08	.036	Deflection over limit
.53	.017	.65	.09	.037	Deflection over limit
.60	.026	.71	.11	.041	Deflection over limit
.57	.026	.75	.08	.051	Deflection over limit

Four heats were lost at the drop test, because they exceeded the deflection limits. On the first, all conditions were reported normal, save that the ingots were held in the pits for an average time of 24 hours. The second heat tapped cold, the pouring nozzle froze, and the ingot tops were spongy. The third tapped hot, but otherwise, and like the fourth, had normal conditions.

PIPING AND SEGREGATION OF INGOTS AND DUCTILITY TESTS.

By P. H. Dudley,
Consulting Engineer, New York Central Lines.

The piping and segregation of ingots of steel is a comprehensive subject, and must be studied with reference to the different grades of soft, medium, and hard steel, rather than in a general manner, as though applicable to all grades. Ingots of rail-steel containing from 0.50 to 0.75 per cent. of carbon are of an entirely different character from those of softer steel when they are sufficiently deoxidized to form comparatively pure steel, as a well-defined shrinkage-cavity forms. This important fact should be remembered in discussing rail-steel, for the greater the degree of deoxidation, the larger will be the difference between the inclosed volume of hot fluid metal in the mold and the cooler resulting set metal, and the still proportionately lesser volume, should the ingot be allowed to become cold before equalizing the heat and rolling.

The exterior blowholes in the outside walls of the ingots can be prevented from forming by sufficient deoxidizers, as silicon, ferro-titanium, or their combination, and aluminum. The latter has been extensively used, but all of its oxidation-products do not always escape from the metal, and it should not be used when the steel is to be subjected to the present heavy wheel loads. The silicon-content for rail-steel now ranges from 0.10 to 0.20 per cent., to make it sound and prevent small blowholes from forming in the setting metal.

When sufficient deoxidizers are used to purify efficiently the steel, then, as must be expected, a small cavity starts to form in the top under the cap of the ingot in the setting steel, and its development should be retarded by stripping the ingot and promptly charging into the reheating furnace.

The sides of the contours of the shrinkage cavities in well-deoxidized steel are parabolic in form, and of proportionately greater volume and depth in the long type of ingots than in those which are short and stubby, but of larger volume and base.

When the mills began to make 33 ft. rails and teemed them in the same ingot molds which had been used for 30 ft. rails, and then rolled them in four 33 ft. 100 lb. rails, a great many ingots were not stripped, weighed and charged into the reheating furnaces with sufficient promptness to prevent a number of piped rails, as the requisite mill practice to check them was not then comprehended under the changed manufacturing conditions.

The segregation was also large, and in 1908 I confined the rolling of Bessemer and open-hearth rails for the New York Central Lines in the United States mills to three 33 ft. rail-length ingots for those of about 19 in. square upon the base. It was also stated in the specifications for the New York Central Lines that short, stubby ingots of from 2.5 to 3 times the length of the width of the base were required for rails. Ingots of about 8,200 lbs. weight, teemed in molds 20 x 24 in., have been extensively made for six lengths of 33 ft. 100 lb. rails, and, in good mill practice, with practically complete elimination of piped rails. The blooms, however, are cut, and only rolled in three rail lengths at a time. Ingots 25 x 30 in., of about 12,000 lbs. weight, have been used for eight 33 ft. basic open-hearth 100 lb. rails where the ordinary rail mill equipment had not been installed. The ingots were bloomed and then shipped to a rail mill to be reheated and rolled, and but a few piped rails were found during manufacture. The rails in the track fulfill the requirements of safety and severe service.

Only 25 piped rails are known to have been found in service in the track in 65, 70, 75, 80, 95 and 100 lb. sections out of about 1,100,000 30 ft. rails, of which the length of the ingot

was not over but under three times the width of the base.

THE DROP AND EXHAUSTED-DUCTILITY TESTS.

The exhausted-ductility tests for the purification of the steel were introduced into the specifications for the New York Central Lines in 1910 to secure rails of sufficient toughness to withstand the low temperatures in the Mohawk valley of from 20 deg. to 30 deg. below zero, though 40 deg. is often reported by the trackmen. The ductility which is possible for a given composition, size of ingots, section, and other steps of manufacture, has been practically ascertained, and it is to see by the exhausted-ductility tests whether or not it is secured.

It requires but a moment to stamp the crop of the rail with the 6 in. spacing bar of seven points before placing the butt on the supports of the drop-testing machine. The elongation of each of the six marked inches on the test-butts after the drop, is measured by a flexible rule, and the increase in hundredths of inches per inch, indicates the per cent. of elongation. It takes but a moment to test the butt, and the exhausted-ductility is obtained in three or more blows, though it is measured after each blow, and recorded.

The term ductility in the specifications for the New York Central Lines, is used in the sense of tenacity and toughness of the steel, the exhausted ductility being its measure. This also becomes a soundness test for seams, segregation, slag inclusions and other foreign matter in the web or head of the rails, and is better than the special nick test in other specifications.

The elongation and exhausted ductility tests of stel rails are made concurrently with the manufacture at the plant under the drop-testing machine on four or 5 ft. lengths of the top crop of the rail bars, the results being tabulated as shown by the appended blanks for ductility and elongation tests, a copy being furnished to the manufacturers.

The butts are tested within three hours after the ingots of a melt are teemed and rolled, and the facts as to the full ductility of the steel as made and rolled are available for the manufacture of subsequent melts. The utilization of such knowledge of each melt has enabled the manufacturers to make rails of greater uniformity, homogeneity, safety, and economy of the output than was believed possible before such tests were installed. The practical non-breakage of such rails in the track for the winter of 1911-12, shows that a high quality was secured in their manufacture.

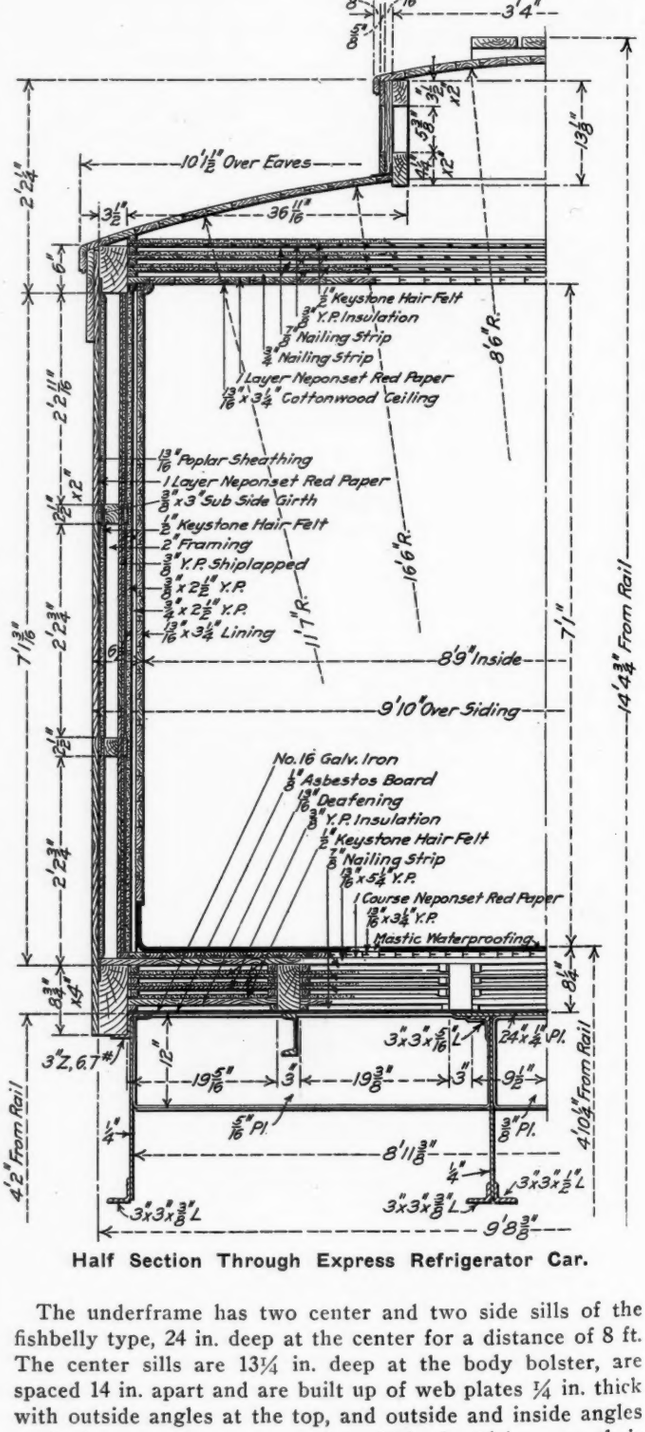
When the ductility tests were first proposed, the most experienced steel men did not think it was possible to secure such uniform results per melt of steel. It was considered by some of the presidents of the steel mills that when dealing with the larger melts of from 60 to 80 tons in a ladle, the temperature might be just right for teeming the first ingot, but too low for the middle ingot to give the full ductility of the chemical composition and to reduce its percentage for the last ingot teemed of the melt. However, the heavy body of slag over the top of the molten steel in the ladle did not allow sufficient heat to escape to modify the ductility in well-made steel from the first to the last ingot poured.

The examination of the results from more than 200,000 tons of steel now shows that it is possible to secure nearly uniform results from each melt. It is found that there is some difference in the ductility which may be obtained, according to the section which is being rolled. The well-designed sections of not too great width of base compared to the height, finish with nearly the full ductility of the metal.

The manufacturers have examined the tabulated results of their product and some have adopted the system of testing and keeping the same records for all rails made for their own information, whether required by their customer or not, as is required by the New York Central Lines. The American Railway Engineering Association has followed the New York Central Lines and adopted nearly their ductility and elongation tests in their specifications.

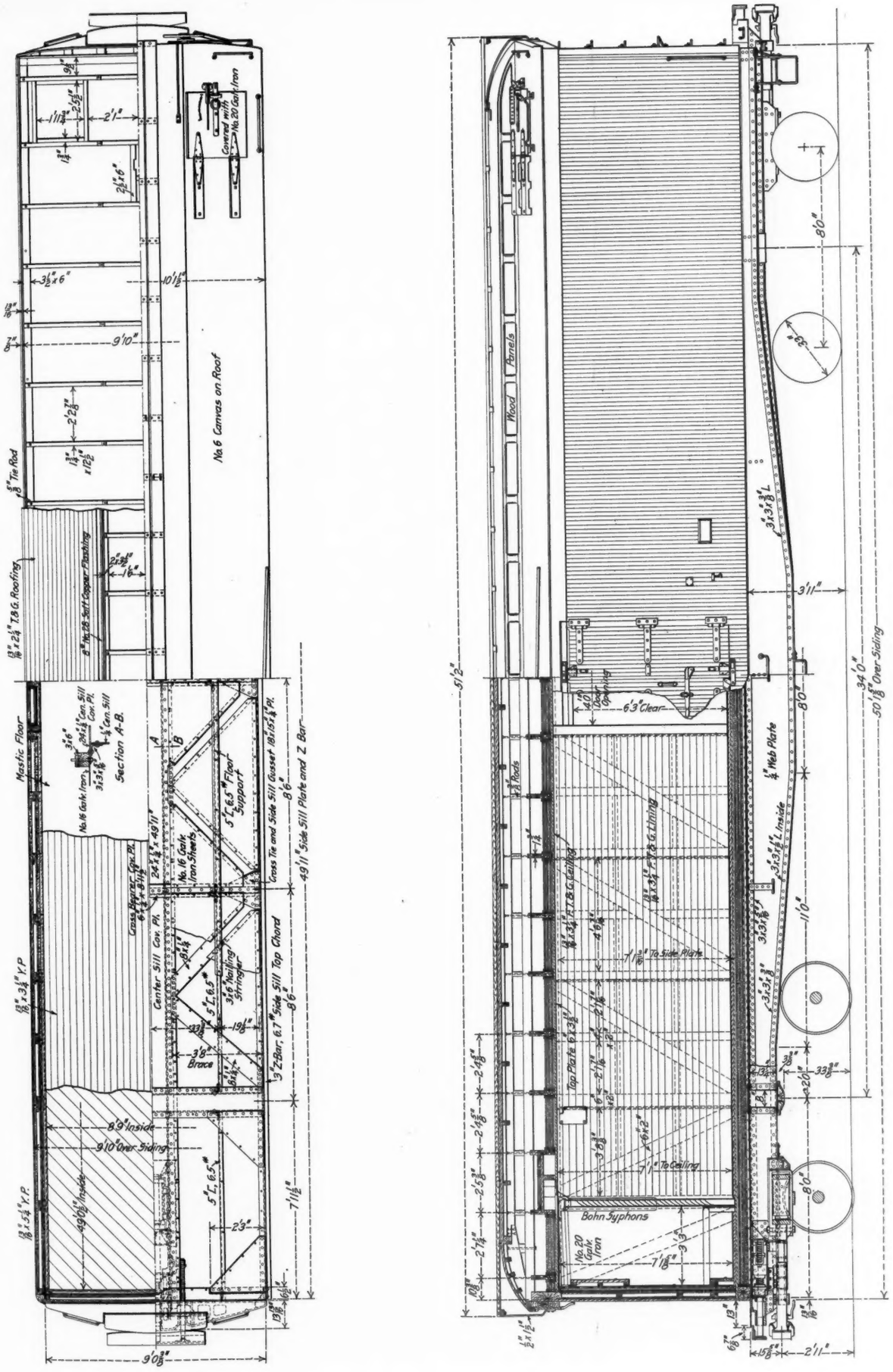
REFRIGERATOR CARS FOR EXPRESS SERVICE.

Wells, Fargo & Company have received from the American Car & Foundry Company the first of an order of 75 steel underframe refrigerator cars for express service. These cars, which are equipped for operation in passenger trains, are 50 ft. in length over end sills, weigh, complete, 86,000 lbs., and have a capacity for 60,000 lbs. of lading and 14,000 lbs. of ice. They are mounted on four wheel trucks, which have 5½ in. by 10 in. journals and are spaced 34 ft. between centers.



Half Section Through Express Refrigerator Car.

The underframe has two center and two side sills of the fishbelly type, 24 in. deep at the center for a distance of 8 ft. The center sills are 13¼ in. deep at the body bolster, are spaced 14 in. apart and are built up of web plates ¼ in. thick with outside angles at the top, and outside and inside angles at the bottom. A top cover plate, 24 in. by ¼ in., runs their entire length. The side sills have ¼ in. web plates, the



General Arrangement of Wells Fargo & Company Express Refrigerator Car.

bottom member being an angle and the top a 3 in. Z-bar, the outside flange of which forms a support for the wooden superstructure.

The end sills are of cast steel, with a flange cast on the upper side to prevent shifting of the car body on the underframe. The body bolsters are built up of ⅜ in. pressed steel members, spaced 8 in. back to back, with top and bottom cover plates 14 in. x ⅝ in., extending between the side sills. Between the bolsters are three built up crossties, consisting of 5/16 in. pressed steel members with top and bottom cover plates. Between the side and center sills a 5 in. channel extends the full length of the car. The underframe is braced by diagonal plates, 8 in. wide, extending from the side to the center sills, and ¼ in. gusset plates connecting the side sills to the body bolsters and end sills.

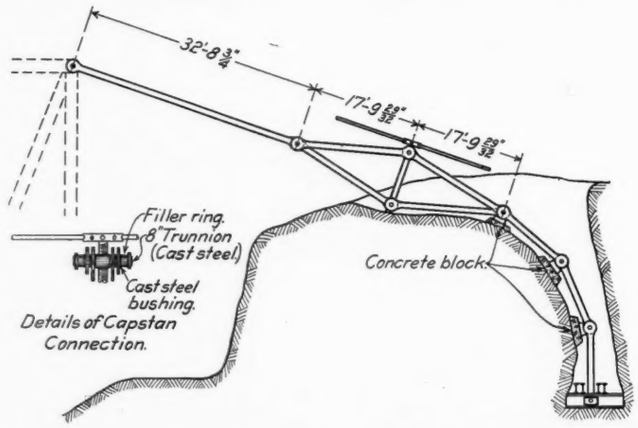
Particular attention has been given to the insulation. On top of, and riveted to the underframe members, is a layer of No. 16 galvanized iron, over which a course of ⅛ in. asbestos paper is applied. There is an air space between this and the 13/16 in. deafening floor, on top of which is a layer of ½ in. Keystone hair felt held in position by ⅞ in. wood furring. To the latter is nailed a single course of ⅜ in. yellow pine, which supports the second course of ½ in. Keystone hair felt, the latter also being held in position by ⅞ in. nailing strips. These in turn support another course of ⅜ in. yellow pine, on top of which is laid the third course of ½ in. Keystone hair felt. This insulation is all located below the main floor, between 3 in. by 6 in. yellow pine nailing sills. Resting on the four nailing sills and the two 4 in. by 8¾ in. side sill fillers, is a course of 13/16 in. by 5¼ in. yellow pine forming the sub-floor. A layer of Neponset red paper is applied between this and the main floor, which is of 13/16 in. by 3¼ in. yellow pine. Over the main floor, except at the ice bunkers, is placed waterproofing and Mastic flooring, made by the H. W. Johns-Manville Co., and this also extends up the sides of the car for 6 in. This permits the floor of the car to be cleaned by flushing with water. The insulation of the sides, ends and roof is similar to that of the floor, three courses of ½ in. Keystone hair felt and a layer of Neponset red paper being used; and it will be noticed that three air spaces are provided.

The Bohn system of refrigeration is used, and also the Bohn all-steel collapsible bulkheads. The hatch covers are placed in the lower deck of the roof, and each bunker has a capacity for 7,000 lb. of ice. The ice grates are made of white oak bars and when not in use can be folded back in a 3-in. recess in the end of the car, thus leaving the ends flush.

The roof is of the monitor or clere-story type, conforming to passenger equipment construction, and a dummy vestibule mechanism is used with Fowler semi-elliptic springs at the end plates. The buffing device is of the Miner friction type and is so applied that the mechanism can be lowered for repairs when necessary. The following special equipment is used: Draft gear, Miner; couplers, McConway & Torley; coupler centering device, American Car & Foundry Company; air brakes, Westinghouse, high speed, schedule, L. N.; hand brakes, Lindstrom; slack adjuster, American Brake Company; truck frames, Commonwealth Steel Company; journal boxes and lids, Symington; wheels, Carnegie Steel Company, 33 in. rolled steel; brake beams, Diamond special; springs, Standard Steel Works; door insulation, La Flare. The cars are constructed throughout to meet M. C. B. standards and the U. S. safety appliance requirements.

THE CROOKED RIVER ARCH BRIDGE.

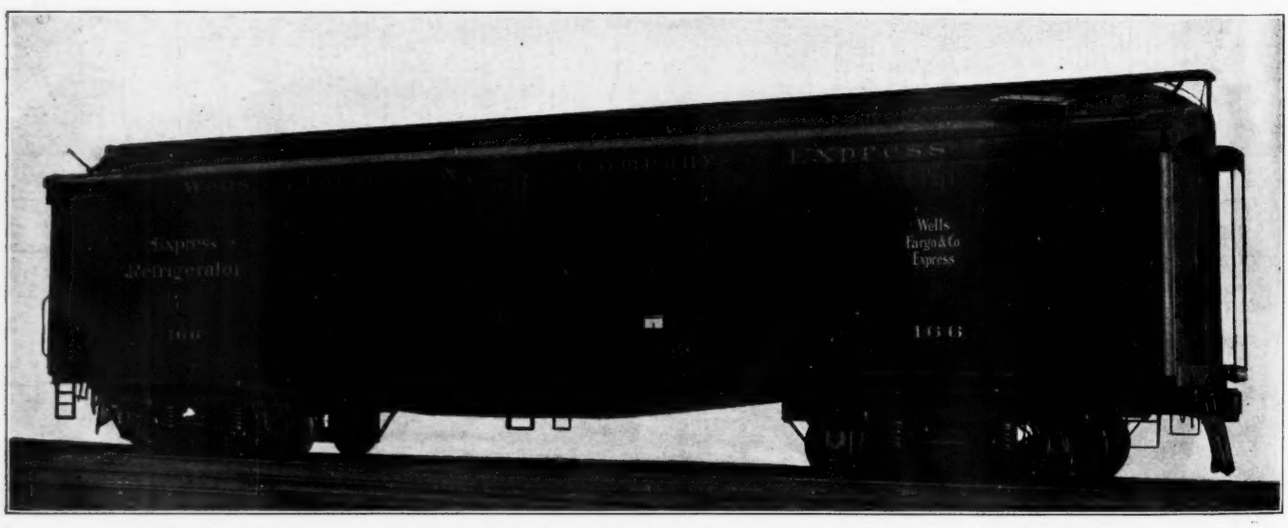
In connection with the bridge work on the Oregon Trunk, described in the *Railway Age Gazette* of March 22 and 29, 1912, the arch bridge which was constructed to carry this line across Crooked river canyon has features which make it unusually interesting. Its location is unique, in that it spans the gorge at a height of 320 ft. above water at a point where the canyon



The Erection Device for Lowering the Cantilever Arms.

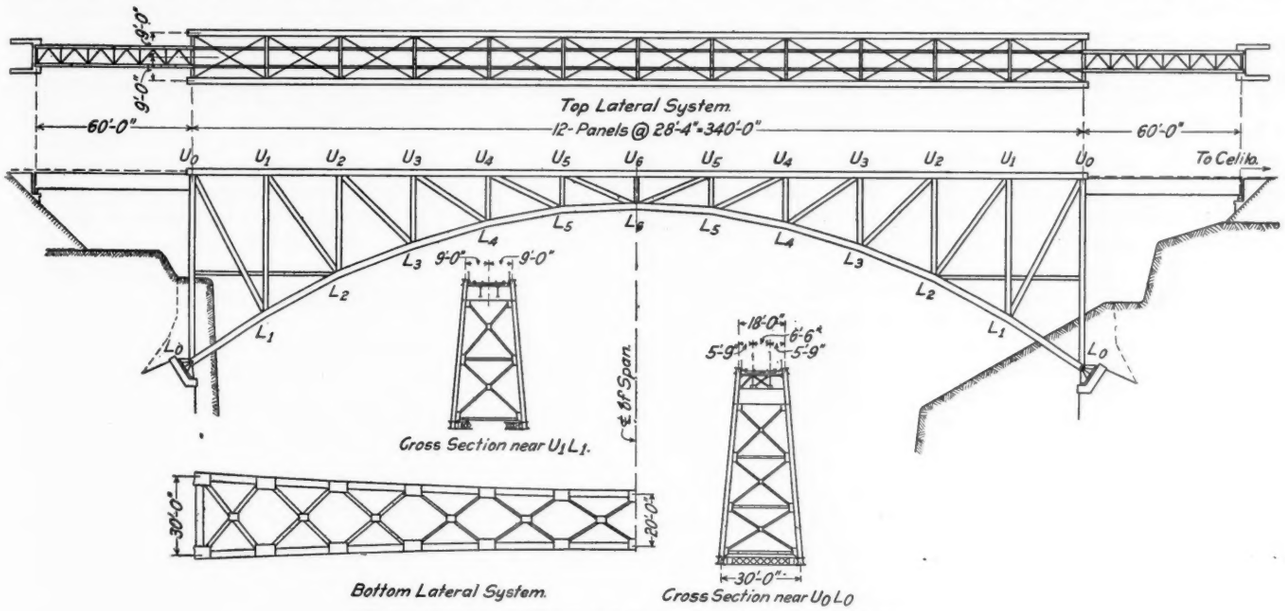
walls are only 350 ft. apart. So far as is known, the only other bridge in this country that carries traffic at a higher elevation above water is the Pecos river viaduct, and the difference is only a matter of inches.

Those who read the description referred to will recall that



Wells Fargo Refrigerator Car for Express Service.

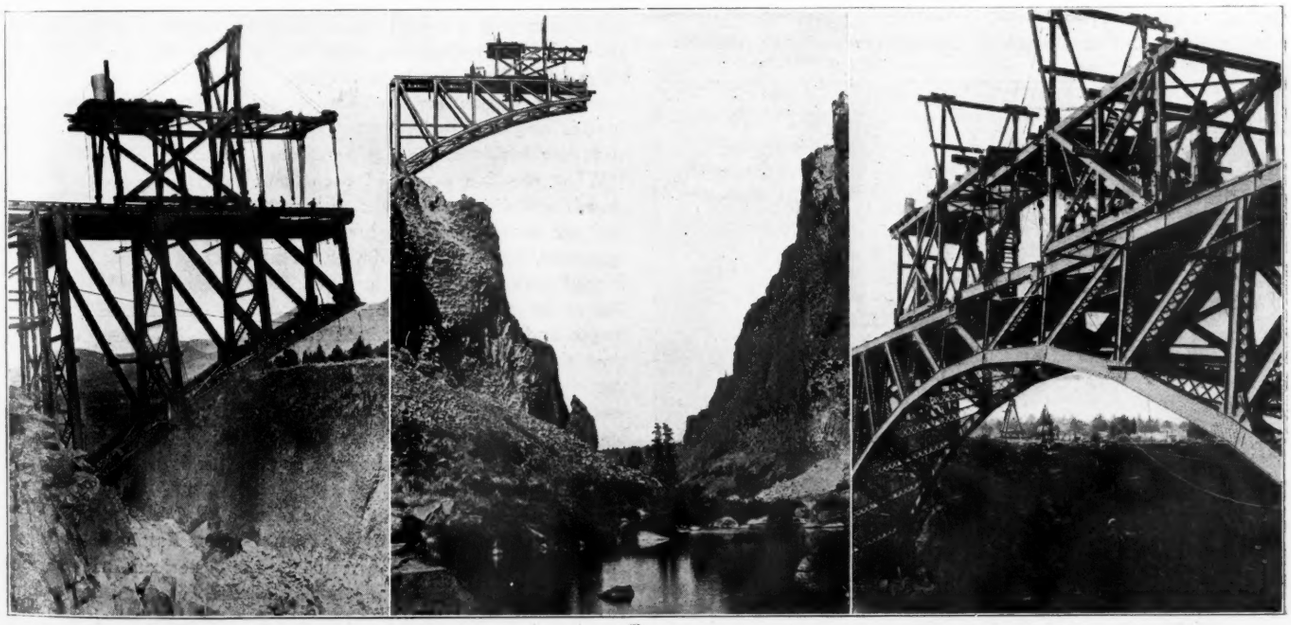
the line leaves the Spokane, Portland & Seattle, or North Bank road, at Fallbridge, on the Columbia river, crosses that stream on the Celilo bridge and penetrates southward into the central portion of Oregon by ascending the canyon of the Des Chutes river onto the central plateau. Twenty-six miles from the present terminus of the road at Bend, Ore., and 130 miles south of the Columbia, the line crosses the Crooked river canyon.



Elevations and Plans of Crooked River Arch Bridge.

The span designed for this crossing is a two-hinged spandrel braced arch—a type well adapted to the conditions. The extreme height of towers which would have been required and the danger to them from masses of rock falling from the steep walls, made a single span crossing preferable to a viaduct. The necessity for erection without falsework and the possibility of securing foundations capable of taking unlimited thrust, led to the selection of an arch span. The type chosen could be erected as a cantilever with practically no changes in the members from the section required for service stresses. In this particular design the sections of the first two panels of top chord were the only ones governed by erection stresses.

The erection of former American arches of the two-hinged type has been complicated by the necessity of securing a division of dead load stresses between top and bottom chords at the center of the span. The uncertainty as to the result of such an attempt to place both chords in compression is avoided in the Crooked river arch, where the structure is designed as a three-hinged arch for dead load stresses by inserting a hinge or pin at the crown. After the trusses have taken their dead load stress, the upper chord section is riveted in place at the crown at a temperature of 60 deg., which converts the arch into the stiffer two-hinged type for live load and temperature stresses. This same idea has been recently used in a 523.5 ft. arch erected by German engineers across the Sanaga river in Africa with very satisfactory results.



Traveller Erecting the Third Panel. Erecting the Fifth Panel on the North End. Placing the Last Top-Chord Member.

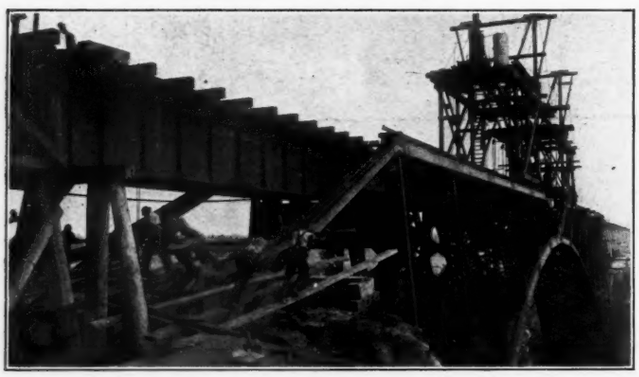
The standard loading for all bridges on the Oregon Trunk

is two 188.5 ton engines followed by 5,000 lb. per ft. for the trusses, and one 214 ton engine followed by the same uniform load for the floor system. All bridges are for single track.

The Crooked river span is 340 ft. long and is divided into 12 panels. The trusses are 72 ft. deep at the ends and 12 ft. at the center, the bottom chord following a parabolic curve. The top chords are 18 ft. center to center, and as the trusses are battered 1 in 12 for greater stability, the Lo points are 30 ft. apart. A massive, three-web, cast steel shoe at this point carries a horizontal pin 13 in. in diameter. The pin holes in the bottom chords connecting at this point are bored on the skew necessitated by the batter of the trusses.

Field work on the bridge was begun while the construction work was proceeding along the road, in order that the foundations would be ready for the steel as soon as rails were laid to the bridge site. This largely increased the cost of the foundation work, as all material supplies had to be hauled in by wagon from Shaniko, 65 miles away. A cableway was set up on the bridge axis to elevate rock and water for the concrete from the bottom of the canyon. After blasting out the weathered rock on the face of the canyon walls down to good quality basalt, the pedestals were built. These were constructed of 1:2:4 concrete, with crushed stone and screenings for aggregate. A machine mixer was used so that the piers might be of uniform quality and monolithic construction.

The erection device, shown in one of the accompanying drawings, consisted of a chain of four eyebars from the Uo point of the arch to the ground and from there running in a curve to the grillage beams set in the bottom of shafts excavated 30 ft. into the solid rock. These shafts were filled with concrete after setting the grillages and bars. To provide for the control of the position of the semi-spans, in closing the arch, an adjustment toggle was placed in the eyebar chain. This consisted of a large parallelogram of eyebars, with a 6½ in. screw working in the short diagonal in such a way as to increase or shorten the length of the figure. There was enough movement in this toggle to provide for raising the arms 15 in. at the crown, or lowering them 8 in. from normal position, in making the connection. The screw was turned by a capstan head, in which were inserted long bars against which the men pushed. Before erection had proceeded



Adjusting Cantilever Arms Before Closure.

far enough to put much load on the anchorages, the toggles were adjusted to give an elevation of 9 in. to the outer end of the arm.

After placing this device and filling the shafts with concrete, the erection contractor built a trestle out to the arch pedestals and assembled his traveler. This was of timber, 76 ft. long over all and with an overhanging boom of 32 ft. Two 8 in. x 16 in. sticks comprised each side of the boom, and were guyed back over a transverse bent by 1¾ in. steel rods. The engine deck was built on the rear end of the boom timbers and was high enough to enable the derrick car to pass underneath. This rig traveled on two rails, laid on short cross ties on the top chords. The complete traveler weighed about 45 tons. Its rigging consisted of six sets of 1¾ in. manila falls and one set of wire falls.

After lowering the 10½ ton shoes to place, the bottom chord was set and the pin driven, after which the end post was placed and the pin driven to connect to the anchorage chain. The diagonal UoL1 was then placed, thus making the panel self-supporting. The remaining members of the panel in the truss and floor system were placed and the traveler run forward to repeat the operation. Riveting was started on all principal truss connections except bottom chord splices in each panel as soon as completed. This was done because of high erection stresses and to reduce the number of drift pins and temporary bolts required for erection.

After five panels of the north arm had been placed, work was started on the south side of the canyon. Materials for the

The Completed Arch.

traveler, falsework and anchorage were carried over the gorge on the cableway, and as soon as the traveler had been constructed, the transfer of bridge material was begun. In doing this the members were lowered into the canyon from the north end and then by hooking on a tackle from the south traveler they were drifted across the stream. The tackles from the north traveler were then removed and the material hoisted and erected. In this way all steel for the south arm was transferred safely and with but little delay to erection.

When the five panels of each arm were finished, the bottom chords and diagonals of the two center panels were put in place, and the two semi-spans lowered to bearing on the center pin by means of the erection device. The structure was then a three-hinged arch. To bring it to its final condition of two-hinges, the center section of the top chord, which was two panels in length and unpunched at both ends, was set in place. The first time the temperature of the steel reached 60 deg., the ends of the chord were center-punched through the holes in the splice plates attached to the adjoining chords, and drilled. One end was then riveted up and the other left until the temperature of the steel had again reached 60 deg., when it was quickly riveted up.

The bridge was designed in the office of Ralph Modjeski, chief engineer of bridges of the Oregon Trunk, Ralph Budd being chief engineer. It was fabricated by the American Bridge Company and erected by the Missouri Valley Bridge and Iron Company. W. R. Weidman was resident engineer, with Ralph Harris and Clement E. Chase, assistants in charge of substructure and superstructure respectively. We are indebted to Mr. Chase for the information contained herein.

Brazilian Surveys Approved.—The president of the state of Sao Paulo, Brazil, has signed a decree approving the definite surveys of the first section of five miles of the line from Jaboticabal to Rio Pardo.

SPEED RESTRICTIONS ON THE CHICAGO & NORTH WESTERN.

The Chicago & North Western recently made practical tests of its speed restrictions of the movements of trains over crossovers, turnouts, junction turnouts, and on certain signal indications at interlocking plants, and as a result has established additional safeguards and rules to govern the speeds of trains. These are as follows:

(1) When a signal to proceed is displayed by a dwarf, or low-speed signal located at the bottom of a home signal, or across the track from it, a train may proceed at a speed not to exceed 15 miles per hour.

(2) The speed of a train moving over a crossover; turnout from a main track to a siding, or to a diverging route at a junction, must not exceed 15 miles per hour, with certain exceptions, the points at which exceptions are permitted being indicated on the current time table by special rules, which give in each case the speed in miles per hour that may be attained at any particular point or turnout at which the above rules do not apply.

In formulating the rules for the speed restrictions at definite points, or for turnouts of varying degrees, the question arose as to whether the restrictions were sufficient to insure absolute safety and smooth operation for the train or whether they were greater than necessary. That is to say, did the restrictions call for lower speed than was essential for the safe and smooth operation of trains over the certain turnouts or stretches of track? In order to satisfy themselves on this point, the general officers of the road conducted a series of speed tests over the crossovers and turnouts in question. A train composed of a high-speed locomotive and several cars was employed for this purpose. A speed indicator was installed in the locomotive for the guidance of the engineman and another one in the observation car on the rear of the train for the convenience of the observers, who were general officers and officers of the division on which the tests were being made. Telephone communication was also established between the locomotive and the observation car, a complete telephone outfit being located in the observation car.

Speed tests were made over leads and crossovers, over turnouts from No. 7 to No. 20, and at varying speeds over each number of turnout, these varying from five miles per hour over No. 7 turnouts to over 50 miles per hour over No. 20 turnouts.

The train was run through each turnout several times at different speeds, and always once or twice at a higher rate of speed than was considered at all, or was later decided upon for that number of turnout.

Careful records were made of the different speeds over each turnout and the behavior of the train noted in each case. It was found throughout the test that it is very difficult to judge the speed of a train while riding on it. Everyone in the large party on the train was inclined to judge its speed when moving at 20 miles or less per hour as less than was actually the case, and when the train was running at 35 miles or more per hour it seemed to be running at a higher rate of speed than that.

The speeds of trains under these restrictions are checked frequently to find out how closely enginemen are able to judge them, and, as an additional precaution, a more general use of speed recorders which will accurately indicate to enginemen the speed at which they are running will be adopted.

THE PHILIPPINE RAILWAY COMPANY.—On June 30, 1912, this company had in operation 59 miles of line in the island of Cebu, Philippine Islands, and 74 miles of line in the island of Panay, a total of 133 miles of line. The lines of this company in the island of Cebu cost $3,317,000, or about $65,283 per mile. The lines in Panay cost $5,065,000 or $68,444 per mile.

THE RAILWAY VALUATION LAW.

It is now expected that Congress will pass a railway valuation law at the present session. The Senate on February 24, passed House Bill 22593 after extensive amendment, and it is believed that the House will readily accept the changes that have been made. The bill as it leaves the Senate provides for valuation not only of physical property, but also of franchises and other intangible values; and provision is made also for investigating the history of past financial operations.

In the bill as reported by the Senate committee and passed by the Senate, the principal section (to be Section 19*a* of the Interstate Commerce law) is as follows:

"That the commission shall, as hereinafter provided, investigate, ascertain, and report the value of all the property owned or used by every common carrier subject to the provisions of this act. To enable the commission to make such investigation and report, it is authorized to employ such experts and other assistants as may be necessary. The commission may appoint examiners who shall have power to administer oaths, examine witnesses and take testimony. The commission shall make an inventory which shall list the property of every common carrier subject to the provisions of this act in detail, and show the value thereof as hereinafter provided, and shall classify the physical property, as nearly as practicable, in conformity with the classification of expenditures for road and equipment, as prescribed by the Interstate Commerce Commission.

"First. In such investigation said commission shall ascertain and report in detail as to each piece of property owned or used by said common carrier for its purposes as a common carrier, the original cost to date, the cost of reproduction new, the cost of reproduction less depreciation, and an analysis of the methods by which these several costs are obtained, and the reason for their differences, if any. The commission shall in like manner ascertain and report separately other values, and elements of value, if any, of the property of such common carrier, and an analysis of the methods of valuation employed, and of the reasons for any differences between any such value, and each of the foregoing cost values.

"Second. Such investigation and report shall state in detail and separately from improvements the original cost of all lands, rights of way, and terminals owned or used for the purposes of a common carrier, and ascertained as of the time of dedication to public use, and the present value of the same, and separately the original and present cost of condemnation and damages or of purchase in excess of such original cost or present value.

"Third. Such investigation and report shall show separately the property held for purposes other than those of a common carrier, and the original cost and present value of the same, together with an analysis of the methods of valuation employed.

"Fourth. In ascertaining the original cost to date of the property of such common carrier the commission, in addition to such other elements as it may deem necessary, shall investigate and report upon the history and organization of the present and of any previous corporation operating such property; upon any increases or decreases of stocks, bonds or other securities, in any reorganization; upon moneys received by any such corporation by reason of any issues of stocks, bonds, or other securities; upon the syndicating, banking and other financial arrangements under which such issues were made and the expense thereof; and upon the net and gross earnings of such corporations; and shall also ascertain and report in such detail as may be determined by the commission upon the expenditure of all moneys and the purposes for which the same were expended.

"Fifth. The commission shall ascertain and report the amount and value of any aid, gift, grant of right of way, or donation, made to any such common carrier, or to any previous corporation operating such property, by the Government of the United States or by any State, county or municipal government, or by individuals, associations or corporations; and it shall also ascertain and report the grants of land to any such common carrier, or any

previous corporation operating such property, by the Government of the United States, or by any State, county, or municipal government, and the amount of money derived from the sale of any portion of such grants and the value of the unsold portion thereof at the time acquired and at the present time, also, the amount and value of any concession and allowance made by such common carrier to the Government of the United States, or to any State, county or municipal government in consideration of such aid, gift, grant or donation."

The rest of the bill, given in following paragraphs, is here reprinted as reported by the Senate sub-committee. Numerous changes in detail were subsequently made, but the only one that seems to be important is an addition providing that in appeals to the courts new testimony may be accepted by the court; and the court shall then stay proceedings and give the commission a chance to revise its valuation:

"Except as herein otherwise provided, the commission shall have power to prescribe the method of procedure to be followed in the conduct of the investigation, the form in which the results of the valuation shall be submitted, and the classification of the elements that constitute the ascertained value, and such investigation shall show the value of the property of every common carrier as a whole and the value of its property in each of the several States and Territories and the District of Columbia, classified and in detail as herein required.

"Such investigation shall be commenced within sixty days after the approval of this act and shall be prosecuted with diligence and thoroughness, and the result thereof reported to Congress at the beginning of each regular session thereafter until completed.

"Every common carrier subject to the provisions of this act shall furnish to the commission or its agents from time to time and as the commission may require maps, profiles, contracts, reports of engineers, and any other documents, records, and papers, or copies of any or all of the same, in aid of such investigation and determination of the value of the property of said common carrier, and shall grant to all agents of the commission free access to its right of way, its property, and its accounts, records, and memoranda whenever and wherever requested by any such duly authorized agent, and every common carrier is hereby directed and required to co-operate with and aid the commission in the work of the valuation of its property in such further particulars and to such extent as the commission may require and direct, and all rules and regulations made by the commission for the purpose of administering the provisions of this section and section twenty of this act shall have the full force and effect of law.

"Upon the completion of the valuation herein provided for the commission shall thereafter in like manner keep itself informed of all extensions and improvements or other changes in the condition and value of the property of all common carriers, and shall ascertain the value thereof, and shall from time to time, as may be required for the proper regulation of such common carriers under the provisions of this act, revise and correct its valuation of property, showing such revision and correction classified and as a whole and in each of the several States and Territories and the District of Columbia, which tentative valuations shall be reported to Congress at the beginning of each regular session.

"To enable the commission to make such changes and corrections in its valuations of each class of property, every common carrier subject to the provisions of this act shall report currently to the commission, and as the commission may require, all improvements and changes in its property, and file with the commission copies of all contracts for such improvements and changes at the time the same are executed.

"Whenever the commission shall have completed the tentative valuation of the property of any common carrier, and the tentative valuations of its property in each of the several states and territories and the District of Columbia, and before such valuation shall be considered in any proceeding involved in the act to regulate commerce, the commission, in addition to notices to petitioners and carriers required in such proceeding, shall give notice by registered letter to the said carrier, the Attorney General of the United States, the governor of any State in which the property so valued is located, and also by publication in three daily papers published in three of the principal cities through which the railroad of such common carrier runs; such notice shall state the valuation placed upon the several classes of property of said carrier, and shall allow thirty days in which to file a protest of the same with the commission. If no protest is filed within thirty days, said valuation shall become permanent.

"If notice of protest is filed the commission shall fix a time for hearing the same, and shall proceed as promptly as may be to hear and consider any matter relative and material thereto which may be presented in support of any such protest so filed as aforesaid. If after hearing any protest of such tentative valuation under the provisions of this act the commission shall be of the opinion that its valuation should not be made permanent, it shall make such changes as may be necessary, and shall issue an order making such corrected tentative valuation permanent. All permanent valuations by the commission and the classification thereof shall be published and shall be prima facie evidence relative to the value of the property in all proceedings under this act.

"The provisions of this section shall apply to receivers of carriers and operating trustees. In case of failure or refusal on the part of any carrier, receiver, or trustee to comply with all the requirements of this section and in the manner prescribed by the commission such carrier, receiver, or trustee shall forfeit to the United States the sum of five hundred dollars for each such offense and for each and every day of the continuance of such offense, such forfeiture to be recoverable in the same manner as other forfeitures provided for in this act.

"That the district courts of the United States shall have jurisdiction, upon the application of the Attorney General of the United States at the request of the commission, alleging a failure to comply with or a violation of any of the provisions of this section by any common carrier, to issue a writ or writs of mandamus commanding such common carrier to comply with the provisions of this section."

Amend the title so as to read: "An act to amend an act entitled 'An act to regulate commerce,' approved February fourth, eighteen hundred and eighty-seven, and all acts amendatory thereof by providing for valuation of the several classes of property of carriers subject thereto and securing information concerning their stocks and bonds and boards of directors."

NEW LINE FROM SHANGHAI TO PEKING.—China has opened her shortest cut from Shanghai, on the sea, to Peking. Early in December through traffic was opened from Pukow, on the Yangtze river (opposite Nanking) to Tientsin, and a journey is now possible from Shanghai to Peking in 40 hours as against 5 days by the previous shortest route. The only other line from the Yangtze to Peking is that from Hankow, about 755 miles long. The newly opened line from Pukow to Tientsin is 626 miles, and to that has to be added the 73 miles from Tientsin to Peking and the 193 miles from Shanghai to Nanking, making the total rail distance from Shanghai to Peking some 892 miles, which is broken only by the Yangtze river at Nanking. The first through trains to run over the line from Pukow to Tientsin left Tientsin and Pukow, respectively, on December 4, and two trains per week are now running from both places, leaving Pukow for Tientsin on Mondays and Fridays at 9 a. m., and arriving at Tientsin on the following days at 11:07 a. m.; and leaving Tientsin for Pukow on Wednesdays and Saturdays at 1 p. m., and arriving at Pukow on the following afternoons at 3:15 p. m. The trains are provided with dining cars and comfortable sleeping cars, and passengers may make the journey in comparative luxury.

General News.

Miss Jane Fairman, who has been in the employ of the Illinois Central in the accounting department for 43 years, will be retired on a pension on March 31.

The Post Office Department reports that the number of parcels carried in the mails in the month of January was about 40 millions; and over one-tenth of these parcels were mailed in Chicago.

The freight house of the Illinois Central and the Yazoo & Mississippi Valley, at Jackson, Miss., was destroyed by fire on February 14. The loss, including the value of freight in storage, is estimated at $75,000.

The strike of the members of the International Brotherhood of Railway Car Men employed on the Missouri, Kansas & Texas, which was declared in September, 1911, was officially called off by officers of the union on February 18.

Counsel for President Chamberlin, of the Grand Trunk, has withdrawn the request that a commission be sent by the federal court to London to take evidence concerning the acts of the Grand Trunk directors in relation to the Southern New England Railway.

The legislature of Indiana has passed a law making it illegal for any person to drink intoxicating liquors on a passenger train or car, steam or electric, except in case of actual sickness of the person using the stimulant, and excepting also drinks taken in cars regularly licensed to sell intoxicating liquors. The penalty for violation of this law is from $5 to $25.

"Stop, look and listen"! at grade crossings is a legend that has long been familiar; but how many people comply with the injunction? Reckless drivers of carriages and automobiles seem to be more numerous than ever. The secretary of the National Highways Protective Society has caused a bill to be introduced in the New York legislature requiring that every vehicle stop within 100 ft. of a grade crossing, and making the violation of the rule a misdemeanor.

West Virginia has an "anti-trust" railroad law, signed by the governor this week, to go into effect July 1 next. The title of the act is: "To preserve competition among common carriers and to prevent monopoly of the business of common carriers, and protect interstate commerce from restraint and monopoly." The act prohibits any director, officer, agent, representative or attorney of any railroad company from acting as president, vice-president, director or general executive officer of any competing line. It also prohibits any railroad from consolidating its stock or franchise with that of any competing road.

The telephone since its introduction on American railroads, has, no doubt, prevented a considerable number of derailments; but it must now look to its laurels; there is a competitor in the field. C. Lagervall, section foreman on the Chicago Great Western, at Renova, Minn., recently discovered in a passing freight train a dragging brake beam, and, though he was quick to give a signal, he was unable to attract the attention of the trainmen. But his gasoline motor car was at hand, and, quickly mounting the car he followed the train to the next stop and there notified the conductor of the dangerous car.

The Postal Telegraph Company has had filed in the United States District Court at Chicago a suit to enjoin the International Brotherhood of Electrical Workers and its members from interfering with its wires. A grand jury investigation shows extensive depredations following the discharge of union employees in December. A mass of testimony revealed the cutting of wires and cable, destruction of wires by means of acid and other forms of violence. Restraint of interstate commerce is alleged. It is requested that the defendants be enjoined from obstructing interstate and government messages over the Postal, from cutting, burning or otherwise injuring its telegraph lines and from interfering by threats, intimidation, persuasion or force with employees or prospective employees of the company. The telegraph company has been powerless to prevent frequently recurring acts of violence, committed usually at night on its thirty-five miles of cables along the elevated railroad lines in Chicago or in underground conduits. These cables are particularly open to attack and difficult to guard.

The safety committee of the New York division of the Pennsylvania Railroad is to hold a meeting at Trenton, N. J., next Sunday evening and a theatre has been engaged, so as to provide ample room; and the general public is invited. There will be an illustrated lecture on railway accidents, their causes and remedies, by Messrs. J. O. Young and H. J. Fackenstall, enginemen, members of the committee. The road will run special trains from Jersey City and from Philadelphia. At Pittsburgh, Pa., March 10, there is to be a "safety first" rally which is expected to be the largest ever. This will be under the management of employees of the Buffalo, Rochester & Pittsburgh; the Baltimore & Ohio; the Bessemer & Lake Erie; the Wheeling & Lake Erie; the Pennsylvania, both east and west; the Philadelphia & Reading; the Western Maryland and the Wabash-Pittsburgh Terminal. The chairman will be R. L. O'Donnel, general superintendent of the Pennsylvania, at Pittsburgh.

A committee composed of Ralph C. Richards, chairman of the central safety committee of the Chicago & North Western, L. F. Shedd, general safety supervisor of the Chicago, Rock Island & Pacific, and W. N. Northcott, metropolitan secretary of the Railroad Young Men's Christian Association, has been appointed to carry out the plan of co-operation between the Y. M. C. A. and the railroads in promoting the "safety first" movement which was mentioned in a recent issue. Lectures are to be prepared by the heads of the safety departments of the various roads. These will be illustrated with photographs which can be shown by lantern slides, and will be delivered at various Y. M. C. A. headquarters; and also at noon and evening meetings wherever large numbers of employees can be reached. The Y. M. C. A. will give the use of its stereopticons, its buildings and all of its equipment for this purpose. It has devised an apparatus called a "shadow box," by the aid of which lantern slide pictures can be shown on a screen in daylight. The subjects of the lectures have been assigned as follows: "Car Shop Risks," by A. W. Smallen, chairman of the safety bureau, Chicago, Milwaukee & St. Paul; "Machine Shop Risks," by George Bradshaw, general safety agent, New York Central Lines; "Transportation Risks," by R. C. Richards, Chicago & North Western; "Yard Men's Risks," by L. F. Shedd, Chicago, Rock Island & Pacific; "Trespassers," by W. B. Spaulding, general claim agent, St. Louis & San Francisco; "Maintenance and Construction Risks," by J. D. M. Hamilton, claims attorney, Atchison, Topeka & Santa Fe.

Pure Drinking Water on Trains.

The Treasury Department has issued an order to the effect that the drinking water on all trains, cars and boats used in interstate commerce must be certified by state or municipal authorities as being incapable of conveying disease. Ice which is put into drinking water must be taken from a safe source, duly certified, and must be washed with water that is safe; and must be handled so as to prevent contamination. Water containers must be cleaned by scalding at least once a week.

A Railroad Clearing House to Be Established in Chicago.

The joint committee appointed by the executive committee of the Society of Railway Financial Officers and the Committee on Corporate, Fiscal and General Accounts of the Association of American Railway Accounting Officers, which met at Pinehurst, N. C., have, after full discussion, unanimously approved the general principle of clearing house settlement of adjusted balances between all railroads. In the discussion, it was found that 13 of the roads centering at Chicago are already organizing a clearing house. It was, therefore, decided to postpone further action by the joint committee until after the clearing house of the 13 Chicago roads had been actually tried out.

A Simple Issue.

Colonel Melvin O. Adams, president of the Boston, Revere Beach & Lynn, a road 15 miles long, speaking before the state legislative committee at Boston, now considering a proposed law to abolish the smoke nuisance, said:

"The narrow gage line, which has developed Winthrop so that it has grown faster than any town in the country except two boom towns out West, will have to send its equipment

to the scrap heap if electrification is ordered. It will drive us into bankruptcy. Yet we carry 20,000,000 people a year to as delightful a breathing spot as there is in the world and carry them from congested Boston for a five-cent fare."

Western Pacific Opposes Union Pacific-Southern Pacific Dissolution Plan.

R. S. Lovett, chairman of the executive committee of the Union Pacific, Attorney General Wickersham, and Maxwell Evarts, general counsel of the Southern Pacific, appeared before four judges of the United States Circuit Court at St. Louis on February 24, and outlined the plan of dissolution of the Union Pacific and Southern Pacific, which has been announced. F. W. M. Cutcheon, general counsel of the Western Pacific, presented a vigorous opposition to that feature of the plan which provides for joint use of the Benicia cut-off between Oakland and Sacramento, arguing that the plan proposed would perpetuate a monopoly. He also opposed some features of the stock distribution plan. Mr. Evarts stated that the Southern Pacific was willing to perpetuate whatever rights the Western Pacific now has over the Benicia cut-off.

The "Merchants' Limited."

The Merchants' Limited express trains of the New York, New Haven & Hartford, leaving New York for Boston and Boston for New York, at 5 p. m., are now made up of new steel cars just out of the shops of the Borman Company. The New Haven road evidently has a new press agent. Describing this as "the most gorgeous train in America," he says:

"These new trains are practically indestructible. Made of steel they could go through a stone wall without being scratched. Reinforced underneath with two immense steel girders running the length of the car and attached at the end to a solid cast steel U frame forming the vestibule, no impact however great could telescope them. A rear end collision might tilt them up on end a bit but that would be all. So far as resisting powers go they are built like battleships."

Each train has four parlor cars and an observation smoking car. The interior finish is Mexican mahogany, except the smokers, in which it is cocoa wood. Each of the parlor cars has 36 chairs, the usual drawing-room having been omitted; and with doors open a passenger standing in the aisle may see from one end of the train to the other, except when the dining car interferes. At night the cars have indirect lighting, each having ten 100-watt lamps distributed along the center. These lamps, with ornamented brass shields beneath them, throw their light up against a white ceiling. The axle lighting system has storage batteries sufficient to supply lighting current for 10 hours. The cars are heated by steam. In the observation smoking car there is a buffet for making coffee.

The Boston & Albany.

A committee of the Massachusetts legislature, having under consideration a proposed law requiring the electrification of railroads in and near Boston, listened last week to a statement of J. H. Hustis, vice-president of the Boston & Albany, telling of the financial difficulties likely to be imposed on that road if electrification should be required. If electric propulsion were adopted it would have to be extended to South Framingham, 21 miles from Boston, and the cost would be over $6,000,000. Allowing for a normal increase in passenger traffic and considering all possible economies resulting from electric operation, Mr. Hustis estimated that there would be a net loss in operation of nearly $500,000 a year. To electrify completely, for freight as well as passenger, would make the cost materially greater than $6,000,000. To the suggestion that passenger fares might be increased, Mr. Hustis said that the increase over present rates would have to be 40 per cent. In view of the active competition of electric street car lines this would be out of the question. To the suggestion that the B. & A. should electrify because the New Haven intended to do so and because the B. & A. is controlled by the New Haven, Mr. Hustis said that each road must be considered by itself. The New Haven does not control the B. & A. It is sending westbound freight over the Boston & Albany, because this is more economical than to send by way of the Western termini of the New Haven; but the traffic agreement between the two roads is intended to make the Boston & Albany an independent operating unit. From nearly two years' experience the wisdom of this arrangement has been fully demonstrated. In this time the Boston & Albany has increased ton mileage 66 per cent., while increasing freight train miles only 21 per cent. Passenger and freight rates have not been increased on the Boston & Albany for 10 years, while yet labor and material have increased in cost tremendously.

Mr. Hustis, continuing, said:

"If the Boston & Albany service, both passenger and freight, today is not generally satisfactory to the public that it serves, then the fact is not known to its management. If the road is to continue to serve the public satisfactorily it must receive from the public that measure of confidence to which its service entitles it. Its management must be allowed reasonable latitude in which to provide for its development. It ought not to be fettered with legislation that will clog its natural growth and in turn react on the community that it is striving to serve. The road is satisfactorily handling a very largely increased traffic at rates which are substantially the same as twelve years ago, and with reasonable expedition, regularity and economy. It has suffered in its operating showing, as have all the railroads, in the enormous increases in expenses, yet its unit costs of operation compare favorably with those of other roads of similar character. The lessee company has, moreover, not allowed the yearly deficit since 1906 to stand in the way of appropriating more money for improvements.

"It has now reached a point where the volume of business, at the rates which have been in effect for more than a decade, just about enables it to meet its operating expenses, leaving practically no surplus. Any contraction in its volume of business, any reductions in rates, or any additional burdens (such as that proposed by compulsory electrification) would prevent the road from earning its guaranteed rental and there would again be an annual deficit, which on the date of the last report to the railroad commission aggregated $5,000,000."

Harriman Safety Medals.

The American Museum of Safety, New York, has appointed the following committee to award annually the medals, given by Mrs. E. H. Harriman, to the railroads which shall have done most to promote the "safety first" idea: Chairman, Arthur T. Hadley, president of Yale University; Samuel O. Dunn, editor of the *Railway Age Gazette;* Franklin K. Lane, chairman of the Interstate Commerce Commission; W. F. Allen, secretary of the American Railway Association, and the Commissioner of Labor. Three medals will be awarded each year as follows: A gold medal to the railroad company itself, a silver medal to the member of the operating department of that road who has done most to bring this condition about, and a bronze medal to the employee of the winning road who has been most conspicuous in the promotion of safety. It is planned to give with each medal an engraved certificate, which may be hung on the wall as the medals will be too valuable for public display. These certificates will bear the name of the giver, those of the members of the committee and that of the recipient. Forms are now being drawn up to be sent out to the roads. These will be submitted to the committee for its approval. The first medals will be awarded in January, 1914.

International Congress of Refrigeration.

The opening meeting of the third International Congress of Refrigeration will be held in Washington, D. C., September 15, 1913, and the business and scientific meetings will be held in Chicago beginning September 15. The preliminary announcements of the congress says that more than 40 countries will be represented by official government delegates, as well as by delegates from industrial associations, technical societies and institutions of learning, also by experts and practical men interested in the application of refrigeration to the various industries. Many different applications of refrigeration will be practically demonstrated by operating and stationary exhibits; so also will the materials by which refrigeration is produced, economized and transmitted, be shown and illustrated. Carloads of refrigerated fruit, vegetables, meat, etc., will also be exhibited just as they are transported under refrigeration. It is proposed

to serve at the banquet only such foods and beverages as are customarily held in cold storage in America. The object of this congress is to provide an opportunity for drawing into concerted action the scientific and practical men of the world who are engaged in developing the science and art of refrigeration, thus affording the aid of properly organized efforts to the many industries that do or can derive benefits from refrigeration. J. F. Dickerson, editor of *Ice and Refrigeration*, Chicago, is secretary.

Southeastern Accounting Conference.

The annual meeting of the Southeastern Accounting Conference was held at Norfolk, Va., on February 6 and 7. Officers for the ensuing year were elected as follows: Chairman, W. L. Bird, auditor Norfolk Southern; secretary, M. B. Nichols, auditor of traffic Central of Georgia. The chairmen of the standing committees for the ensuing year are as follows: General Accounts and Subjects, M. F. Molloy, comptroller Cincinnati, New Orleans & Texas Pacific; Passenger Accounts, T. H. Wright, auditor passenger receipts Seaboard Air Line; Freight Accounts, William McGowan, auditor merchandise receipts Baltimore & Ohio; Disbursement Accounts, J. H. McEwen, auditor of disbursements Nashville, Chattanooga & St. Louis; Efficiency, W. D. Beymer, comptroller Central of Georgia. The next meeting will be held in Louisville, Ky., on October 9 and 10, 1913.

Chicago Transportation Association.

The sixth annual dinner of the Chicago Transportation Association was held at the Auditorium hotel on February 20. W. A. Garrett, vice-president of the Chicago Great Western, acted as toastmaster, and the speakers were J. N. Tittemore, Rev. W. T. Dorward and Harry F. Atwood.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Convention, May 6-9, St. Louis, Mo.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill. Annual meeting, June 17-20, Buffalo, N. Y.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Friday of March and September.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec, Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, May 21, New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-23, 1913, Montreal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Convention, March 18-20, 1913, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 11-13, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.; annual, June, 1913.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 20-22, 1914, New Orleans, La.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago. Next meeting, May, 1913, Baltimore, Md.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Semi-annual meeting, June, 1913, Atlantic City, N. J.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago; annual, May 20, 1913, St. Louis, Mo.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.

ASSOCIATION OF WATER LINE ACCOUNTING OFFICERS.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y. Annual meeting, October 8, Philadelphia, Pa.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va. Next convention, June 18, Bluff Point, N. Y.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago. Annual meeting, May 21-24, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 829 West Broadway, Winona, Minn. Next convention, July 22-25, Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Annual meeting, August 18, Richmond, Va.

MAINTENANCE OF WAY MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—W. G. Wilson, Lehigh Valley, Easton, Pa.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Convention, May 26-29, 1913, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Convention, June 16-18, Atlantic City, N. J.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Annual meeting, September 9-12, Ottawa, Can.

NATIONAL RAILWAY APPLIANCES' ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meeting with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILROAD CLUB.—C. L. Kennedy, C., M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Tuesday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York. Annual dinner, second week in December, 1913, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo. Next meeting, August 12-15, Nashville, Tenn.

RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City, Southern, Kansas City, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa. Meetings, March 17, Chicago; June 10-11, New York; convention, October 14, Nashville, Tenn.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio. Annual convention, May 19-21, Chicago.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

RAILWAY TEL. AND TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Convention, September 8-12, 1913, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala. Next meeting, April 17, Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago. Annual meeting, June 17, Los Angeles, Cal.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Annual meeting, August, 1913, Chicago.

UTAH SOCIETY OF ENGINEERS.—R. B. Ketchum, University of Utah, Salt Lake City, Utah; 3d Friday of each month, except July and August.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

The general deficiency bill, carrying $24,235,740 to supply deficiencies in appropriations has been reported, providing for the Commerce Court until Congress decides whether the tribunal shall be abolished.

The Chicago, Rock Island & Pacific is running a "diversified farming special" train over its lines in northwestern Missouri and northeastern Kansas, in co-operation with the Agricultural College of Missouri, and the St. Joseph Agricultural Congress.

A sixth demonstration farm has been established by the Missouri Pacific, at Arcadia, Mo., on the grounds of the Arcadia College adjoining the right of way of the railway. Eighteen acres will be placed under cultivation at once. A specialty will be made of fruits, especially apples.

W. L. English, who has recently been connected with the agricultural extension work of Clemson Agricultural College, South Carolina, has been appointed supervisor of agriculture of the St. Louis & San Francisco, and will have supervision over a large number of demonstration farms to be established in several states traversed by the Frisco lines.

The largest single shipment of automobiles ever sent out of Michigan was recently started from the Buick plant in Detroit, consigned to the Buick company's representatives in San Francisco, via the Pere Marquette, Chicago, Rock Island & Pacific, and Union Pacific. The train consisted of 75 cars drawn by two locomotives. The shipment consisted of 375 automobiles of factory cash value of $431,925.

The Bangor & Aroostook has notified the Interstate Commerce Commission of the cancellation of all joint freight tariffs with the Maine Central, the Boston & Maine, and the New York, New Haven & Hartford, because of the alleged arbitrary and discriminatory manner of these roads towards the Bangor & Aroostook. The B. & A. intends to bring suit against these roads for $75,000 or more, alleged to be overdue on traffic balances.

The Traffic Club of Cleveland was organized on February 15, by 78 traffic officers of railways, water lines, electric lines and industrial concerns. D. F. Hurd, of the Traffic Bureau of the Cleveland Chamber of Commerce, was elected president; W. A. Newman, general freight agent of the Lake Shore & Michigan Southern, vice-president; J. A. Coakley, division freight agent of the American Steel & Wire Co., second vice-president; W. V. Bishop, traffic manager of the Upson Nut Co., secretary, and C. M. Andrus, traffic manager of the Otis Steel Co., treasurer.

The express companies operating in Canada report to the Canadian government net earnings for the calendar year 1912 as follows:

Canadian Express Co. (owned and operated by the Grand Trunk)	$283,281
Dominion Express Co. (owned and operated by the Canadian Pacific)	645,288
Canadian Northern Express Co.	192,436

The gross receipts of the three companies for the year were $10,994,418. The business done by all the express companies, including the American companies operating to some extent in Canada, in financial paper during the year, such as money orders, travelers' checks, C. O. D. checks, telegraphic transfers and letters of credit, amounted to $56,995,122, as compared with $52,165,852 in 1911.

On March 3, the Denver & Rio Grande, in connection with the Colorado Agricultural College, will start a special agricultural demonstration train over its line on a nine day tour of the principal farming and stock raising sections of the Upper Arkansas, Eagle, Roaring Fork, Grand, Uncompahgre, North Fork and San Luis valleys in Colorado. This special educational train will consist of coaches for lecture purposes and baggage cars containing exhibits on agronomy, including alfalfa improvement, seed selection, seed improvement, bee culture, animal husbandry, including dairying and poultry raising, home economics, rural school betterment and other subjects of vital interest to the farming and stock-raising communities. This is the fifth year that the Denver & Rio Grande in co-operation with the agricultural colleges of Colorado and Utah has operated special demonstration trains through its agricultural districts.

Traffic Club of Chicago.

The nominating committee of the Traffic Club of Chicago has named the following as the regular ticket to be voted on at the annual election on March 25: President, Guy S. McCabe, general western agent, Pennsylvania Lines; secretary, W. H. Wharton, commercial agent, Nashville, Chattanooga & St. Louis; treasurer, Charles B. Hopper, general freight agent, Goodrich Transportation Company; first vice-president, W. M. Hopkins, manager transportation department, Chicago Board of Trade; second vice-president, Frank W. Smith, member Uniform Classification Committee; third vice-president, L. Richards, traffic manager, Quaker Oats Company. Directors for two years: F. B. Montgomery, traffic manager, International Harvester Company; V. D. Fort, assistant freight traffic manager, Illinois Central; C. E. Finch, general agent, American Express Company; H. K. McEvoy, assistant general passenger agent, Chicago & Alton.

Packing Boxes; A New Association.

Much interest has been aroused by a complaint filed with the Interstate Commerce Commission by the R. W. Pridham Company, of Los Angeles, Cal., against the Southern Pacific and 37 other railways, demanding the same rates eastbound on goods in fibre boxes as are given on shipments in wooden boxes. The case was heard at Los Angeles on January 28, and an adjournment was taken for the introduction of further testimony in Chicago at a later date. It is understood that this case will open up an investigation by the commission of the entire subject of the use of substitutes for wooden boxes. At a meeting held in Chicago last week the Association of Users of Fibre Board Containers was organized "to co-operate with the transportation companies and manufacturers of fibre cases in establishing and maintaining the high standard of shipment containers, and to at all times procure from the transportation companies fair and equitable recognition, regulation, and facilities for shipments in said containers."

At the annual meeting of the National Poultry, Butter and Egg Association, held in Chicago recently, the subject of packing cases was one of the principal topics of discussion, and the transportation committee was authorized to confer with the carriers and co-operate in devising ways and means for the elimination of economic waste, loss and damage in the handling of poultry, butter and eggs. The transportation committee then conferred with the General Managers' Association, of Chicago, which appointed a standing committee of three to co-operate with the transportation committee of the National Poultry, Butter and Egg Association.

The National Association of Box Manufacturers, at its annual convention in Chicago, February 18 to 21, also devoted much of the time of the meeting to the discussion of the packing box situation. J. E. Williams, chairman of the Uniform Classification Committee, addressed the association briefly on the possibilities of standardizing wooden boxes from the classification standpoint, and offered to assist the standardization committee of the association in any manner compatible with the duties of his office.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railroads of the American Railway Association in presenting statistical bulletin No. 137-A giving a summary of car surpluses and shortages by groups from November 8, 1911, to February 15, 1913, says: The total surplus on February 15, 1913, was 52,700 cars; on February 1, 1913, 62,045 cars, and on February 14, 1912, 50,886 cars. Compared with the preceding period; there is a decrease in the total surplus of 9,345 cars, of which 6,191 is in box, 4,654 in coal, and an increase of 98 flat and 1,402 miscellaneous cars. The decrease in box car shortage is general, except in groups 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida), and 7 (Montana, Wyoming, Nebraska and the Dakotas). The decrease in coal car surplus is in all groups, except 7 (as above), 8 (Kansas, Colorado, Oklahoma, Missouri and Arkansas), and 9 (Texas, Louisiana and New Mexico). The increase in flat car surplus is in groups 5 (as above), 6

(Iowa, Illinois, Wisconsin and Minnesota), 7, 8, 9 (as above), 10 (Washington, Oregon, Idaho, California, Nevada and Arizona), and 11 (Canadian Lines). The increase in miscellaneous car surplus is in groups 3 (Ohio, Indiana, Michigan and western Pennsylvania), 4 (the Virginias and Carolinas), 5, 6, 7, 8, 9 and 10 (as above).

The total shortage on February 15, 1913, was 30,517 cars; on February 1, 1913, 24,785 cars, and on February 14, 1912, 36,928 cars. Compared with the preceding period; there is an increase in the total shortage of 5,732 cars, of which 2,491 is in box, 2,476 in coal, 883 in miscellaneous, and a decrease of 118 flat. The increase in box car shortage is in groups 1 (New England Lines), 2 (New York, New Jersey, Delaware, Maryland and eastern Pennsylvania), 3, 5, 6 and 10 (as above). The increase in coal car shortage is in groups 2, 3, 5, 8 and 9 (as above). The increase in miscellaneous car shortage is in groups 1, 2, 3, 6 and 11 (as above). The decrease in flat car shortage is in groups 1, 4, 6 and 10 (as above).

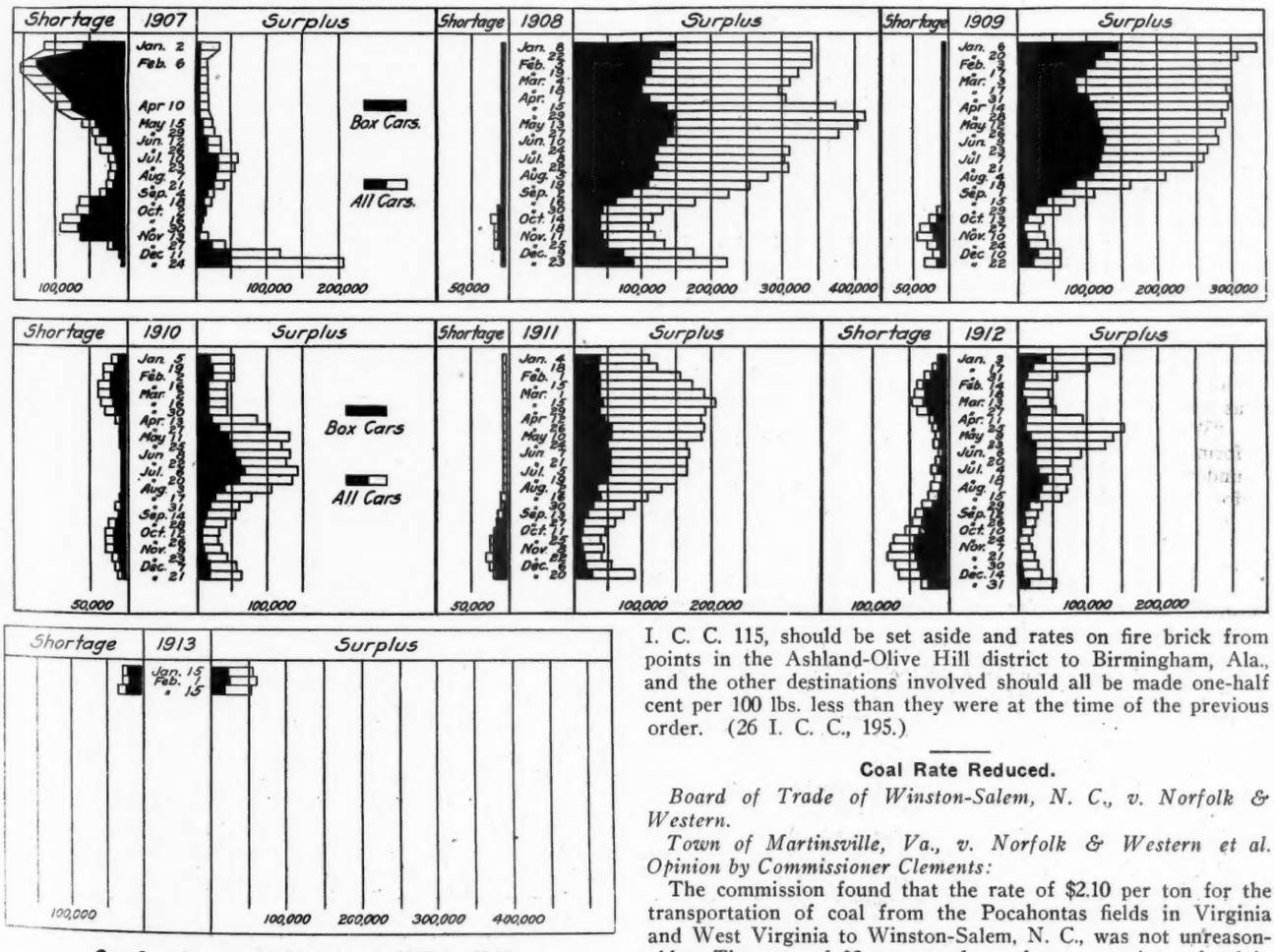
Compared with the same date of 1912; there is an increase in the total surplus of 1,814 cars, of which 5,383 is in box, 779 in coal, and a decrease of 2,542 flat and 1,806 miscellaneous cars. There is a decrease in the total shortage of 6,411 cars, of which 4,910 is in box, 1,408 in coal, 1,036 in miscellaneous, and an increase of 943 flat cars.

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report, and the diagram shows total by weekly surpluses and shortages from 1907 to 1913.

CAR SURPLUSES AND SHORTAGES.

Date.	No. of roads.	Surpluses: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—February 15, 1913	7	0	520	28	12	560	598	18	222	533	1,371
" 2.— " 15, 1913	32	817	38	636	169	1,660	203	12	3,533	5	3,753
" 3.— " 15, 1913	31	932	436	2,273	1,545	5,186	3,836	12	416	715	4,979
" 4.— " 15, 1913	11	6,471	93	1,019	1,431	9,014	932	536	2,025	200	3,693
" 5.— " 15, 1913	28	393	31	147	707	1,278	3,535	518	664	78	4,795
" 6.— " 15, 1913	32	472	574	2,175	2,942	6,163	6,493	494	210	227	7,424
" 7.— " 15, 1913	5	159	203	1,161	494	2,017	445	0	19	0	464
" 8.— " 15, 1913	18	1,109	627	1,848	1,725	5,309	484	1	66	36	587
" 9.— " 15, 1913	15	1,876	294	354	938	3,462	0	58	13	0	71
" 10.— " 15, 1913	23	4,243	1,860	2,602	8,123	16,828	672	10	28	481	1,191
" 11.— " 15, 1913	7	337	578	0	308	1,223	1,986	91	0	112	2,189
Total	209	16,809	5,254	12,243	18,394	52,700	19,184	1,750	7,196	2,387	30,517

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin and Minnesota lines; Group 7—Montana, Wyoming, Nebraska, North Dakota and South Dakota lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Washington, Oregon, Idaho, California, Nevada and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages, 1907 to 1913.

INTERSTATE COMMERCE COMMISSION.

Fire Brick Rates Reduced.

Ashland Fire Brick Company et al. v. Southern et al. Opinion by Chairman Lane:

The commission found that the previous order in this case, 22 I. C. C. 115, should be set aside and rates on fire brick from points in the Ashland-Olive Hill district to Birmingham, Ala., and the other destinations involved should all be made one-half cent per 100 lbs. less than they were at the time of the previous order. (26 I. C. C., 195.)

Coal Rate Reduced.

Board of Trade of Winston-Salem, N. C., v. Norfolk & Western.

Town of Martinsville, Va., v. Norfolk & Western et al. Opinion by Commissioner Clements:

The commission found that the rate of $2.10 per ton for the transportation of coal from the Pocahontas fields in Virginia and West Virginia to Winston-Salem, N. C., was not unreasonable. The rate of $2 per ton from the same points of origin

to Martinsville, Va., was found to be unreasonable to the extent it exceeds $1.80. (26 I. C. C., 146.)

Transit Case.

In re investigation into the substitution of tonnage at transit points. Opinion by Commissioner McChord:

This is the third supplemental and final report of the commission in this case. In the early part of last year the commission learned that the tariffs in many instances named transit privileges in such a manner as to conceal their real application. The commission issued an order, effective August 15, 1912, mentioned in the *Railway Age Gazette* of July 12, page 75, directed against the defendants publishing transit privileges on grain and grain products, requiring them to place certain restrictions around the privileges as published which were deemed necessary to meet the evils found accompanying the operation of the tariffs then in force. That order served to reveal the real nature of the privileges and rates as published, and it was found that the tariffs did not in reality contain the privileges they were supposed to contain. The result was that the tariffs were then enforced for the first time in a manner in which they should have been in force at all times. Shippers and millers, particularly in the Northwest and Southwest, at once complained that their business was seriously hurt. The commission immediately took up the case again and its conclusions were covered in the supplemental opinion of November 12, 1912, mentioned in the *Railway Age Gazette* of November 22, page 1007. In this opinion the commission showed that an intolerable situation had arisen due to the failure of the carriers to so publish their tariffs as to keep pace with the transit privileges and to openly publish every rate, practice or privilege that the carriers permit on their line. The commission then decided to hold further and more complete hearings on this subject. Consequently two conferences were held, at the first of which the shippers stated their side of the case, and at the second of which the carriers stated theirs. The gist of the propositions submitted at these conferences was a request for the authorization of substitution. The only limitation thereto was that one article or commodity should not be substituted for an entirely different article or commodity. In other words, it was desired to regard all wheat as wheat, all corn as corn, all hardwood as hardwood, etc. Both conferences requested that rule 76 of the Tariff Circular be abolished, and as it is true that all that the commission has said upon this subject of transit since that rule was adopted, has been based upon that rule, if it is superseded practically all the commission's subsequent requirements on the subject of transit will go with it, insofar as they constitute binding rules of action. As the previous administration of the commission upon the subject of transit was under circumstances quite different from those of today, and as much of what the commission originally set out to accomplish has now been accomplished, the commission feels that it is justified in adopting a different course of action. The substitute proposed by the carriers' conference contains substantially the same general thought as that of the shippers and is as follows:

"When rules and regulations have been established in tariff form clearly defining the purpose or purposes for and the terms under which transit privileges are granted, and providing also for the effective policing of the operations under the arrangement, a shipment may be stopped in transit and the same shipment or a proper equivalent (less invisible loss in weight), as set forth in said rules and regulations, may be forwarded at the through rate provided for by tariff from the original point of shipment to final destination plus the charge for transit privilege, if any. (This rule shall not be construed to authorize the publication of tariffs providing for the substitution of one commodity for a commodity of a different kind. That is to say, oats or the products of oats for corn, corn or the products of corn for wheat, wheat or the products of wheat for barley, or shingles for lumber.)"

The commission was assured, both on behalf of the carriers and shippers, that the carriers can lawfully publish tariffs specifically permitting substitution in so many words, and that in the absence of a showing that they are unreasonable or unjustly discriminatory, they would be entirely proper and no harm would be done. The proposed amendments to rule 76 are drawn with this idea in mind. The commission decided that rule 76 should be canceled, but that it should not publish as a ruling of the commission the requirements which were proposed. It further decided that the policy of making orders, drawing rules or expressing views as to what would or would not under certain conditions be considered a violation of law as to transit privileges, should not further be indulged in by the commission, but that it should be left to the carriers to establish their own rates, regulations and practices subject to the appropriate action on the part of the commission or the court in the event that these rates, regulations or practices are found to be in violation of the law. This report closes the so-called "transit" case, and the order heretofore entered in this proceeding will be revoked and conference rulings 181 and 203 and rule 76 of the Tariff Circular will be withdrawn (26 I. C. C., 204).

STATE COMMISSIONS.

The Texas railroad commission has issued an order requiring the absorption of all switching charges on less than carload shipments on which the earnings amount to $7.50 or more per car.

Charles Bradden, of Ryde, Pa., has asked the railroad commission of that state to authorize a railroad company to permit him to cross its tracks, but the commission refuses to do so, saying that the constant endeavor should be to keep people from crossing tracks.

The railroad commission of Pennsylvania has called the Erie Railroad to account for requiring duplex tickets to be mailed to New York city for redemption. The commission holds that the Erie, like other roads, should provide for redeeming these tickets at local offices.

The railroad commission of Louisiana has fined the Kansas City Southern $100 for not keeping passenger cars on the line between DeQuincy and Lake Charles, warm enough to make the passengers comfortable. The special offense was on Friday night, December 6, last.

Harvey C. Forney, of Dauphin, Pa., has asked the state railroad commission to take action to cure the chronic lateness of a train running to that town, but the commissioners tell him that the train in question is an interstate train and the commission cannot interfere with it, without running contrary to the authority of the Interstate Commerce Commission.

The Texas railroad commission, which recently made a revaluation of the property of the Galveston, Houston & Henderson, placing it at $2,985,576, has allowed an additional amount of $41,423 for the road's proportion of loss in the destruction of the Galveston Bay bridge, which makes the total valuation large enough to cover the outstanding stocks and bonds amounting to $3,000,000. The valuation will permit the company to refund its indebtedness.

The traveling men of Louisiana have won their campaign for linen covers on seats in passenger cars, or at least they have half won it. After conferences which, it appears, resulted in an agreement with the railroads, the state railroad commission has revised its order, which was appealed from by the railroads, and now requires linen or other washable covers to be used on the backs of all seats to the extent of not less than one half of the backs, beginning at the top. These must be kept in service, and in a clean and sanitary condition, from May 15 to October 15.

The railroad commission of Louisiana, having investigated the condition of the road bed and tracks of the Opelousas, Gulf & Northeastern decides that the road is not in safe condition for the proper operation of trains. "Trains may be run over this road at a very low rate of speed, with utmost caution, without greatly endangering the lives of passengers"; but the commission orders and commands the road, within nine months, to put the tracks in safe condition for the operation of freight and passenger trains (speeds not stated). The road extends from Melville to Crowley, 57 miles.

The railroad commission of Alabama has ordered the Louisville & Nashville to reduce passenger fares between all points in Alabama on March 6 to the basis of 2½ cents a mile. Following the order of the Federal Court last summer annulling the former tariff prescribed by the commission (2 cents a mile) the Louisville & Nashville and the other principal roads of this state restored their fares to the basis of 3 cents a mile, at the

same time increasing freight rates as permitted by the decision of the court. The state commission at once began a new investigation of fares and now, following numerous hearings, has issued the present order.

The railroad commission of Oregon has ordered the railroads of the state to provide in all passenger cars bubbling drinking fountains, or free individual drinking cups for passengers, the fountain being preferred. Complying with the order of the federal government and a similar order issued by the Oregon State Board of Health, the railroads have done away with the common drinking cup, but have supplied nothing in its place; and the railroad commission finds that this omission to provide suitable and clean facilities whereby passengers may obtain drinking water from the tanks in the cars is unjust, unreasonable and inadequate. The order must be complied with in sixty days.

The Board of Railway Commissioners of Canada has decided in favor of the Canadian railways in the pulp wood rate case. The proposed rates which were filed by the most important Canadian railways increased the rates on pulp wood to New York points one cent per 100 lbs. The leading paper manufacturers in New York opposed the increase, and in this were supported by leading Canadian pulp wood dealers. The United States paper manufacturers contended that the new rates would increase the cost of the wood to them by from 35 to 45 cents a cord and increase the cost of their finished product 50 cents a ton; the Canadian wood dealers contended that they would be the losers. The new rates will not become effective until August 15.

The New York State Public Service Commission, second district last week received from the New York Central and the New York, New Haven & Hartford, petitions for rehearing of the cases in which the commission ordered reductions in fares to and from New York City; but on Tuesday, February 25, denied both. The petitioners asked that the operation of the order be suspended. They declared that the order would confiscate property without due process of law and they disputed the finding of the commission that, as a matter of public policy, the season-ticket rates to New York City should be fixed at the lowest possible point. The New Haven road also complained because the rates prescribed would not be consonant with interstate rates over the same routes. The New York Central complained that the new rates were ordered before it had had suitable opportunity to be heard in remonstrance; that the case having been begun about two years ago, the conditions had changed since the last testimony was submitted; but the commission says that during a period of eight months the road has neglected to produce its evidence. The decision of the commission in this case was reported in the *Railway Age Gazette,* February 14, page 295.

The California Railroad Commission has rendered a decision in regard to the present dissolution plan of the Union Pacific and Southern Pacific which may be summarized as follows: The Southern Pacific is ordered to give all competing railroads an opportunity to use the Benicia Short Line from Sacramento to San Francisco if it grants this privilege to the Central Pacific. The Southern Pacific is ordered to give to all competitors certain rights to terminal facilities on San Francisco bay and industrial tracks at junction points. The Central Pacific and Southern Pacific are ordered to file joint rates not to exceed rates now in force within the state. Julius Kruttschnitt, chairman of the board of the Southern Pacific, in commenting on the California commission's decision, said in part: "If the decision of the commission is upheld by the circuit court of St. Louis, the Union Pacific-Southern Pacific dissolution plan must go by the board and negotiations will have to be begun from the beginning. In a word, an entirely new plan will have to be devised. The commission's decision includes many conditions that the Union Pacific has all along been unable to accede to and which the Southern Pacific in its turn has found impossible to accept." [See an item in general news in regard to developments before the circuit court at St. Louis.]

Cost of Railroad Commissions.

The railroad commissioners of Tennessee, calling attention to the small salaries paid to men holding that office in that state—$2,000 to each commissioner, with only $4,500 for secretary, stenographer and traveling expenses—give the following list of other states in which the appropriation for railroad-commission expenses is larger than in Tennessee:

Wisconsin	$99,819	California	$37,000
Oklahoma	73,000	Minnesota	35,000
Nebraska	66,511	Oregon	32,700
Massachusetts	64,912	Virginia	29,100
Arkansas	64,000	Georgia	28,700
Pennsylvania	47,000	North Carolina	24,340
Ohio	38,300	Alabama	19,100
Illinois	37,200	Kentucky	17,300
Texas	37,280	Tennessee (total last year)	11,400

In the state of New York, which does not appear in this list, there are two commissions of five members each, and each one of the ten commissioners receives a salary of $15,000 a year.

Louisiana Flagging Rule; Order for Examination of Men.

The Railroad Commission of Louisiana, after notice and a general investigation has issued an order, No. 1517, relative to the proper protection of trains by flagmen. The commission concludes that on many of the railroads the flagging rule is inadequate and unsafe. The rule now prescribed is said to be in effect on the Southern Pacific in Louisiana, and "its efficiency has been proven beyond question." This rule with a few modifications is as follows:

"*Ordered,* That when a train stops or is delayed, under circumstances in which it may be overtaken by another train, the flagman must go back immediately with stop signals a sufficient distance to insure full protection. When recalled he may return to his train, first placing two torpedoes on the rail, when the conditions require it. The front of a train must be protected in the same way when necessary by front brakeman. If the front brakeman is not available the fireman must act in his place.

"(a) Between sunrise and sunset the flagman shall immediately after he leaves his train light a red fusee and carry it with him back one-quarter of a mile to the point where he places the first torpedo and must leave a burning fusee at the same point as the first torpedo.

"A sufficient distance to insure full protection requires that flagman shall go back to a point one-fourth mile from the rear of his train, where he must place one torpedo on the rail. He must then continue to go back at least one-half mile from the rear of his train and place two torpedoes on the rail, not more than two rail lengths apart; he may then return to within one-fourth mile from the rear of his train, and remain there until recalled. If a passenger train is due he must remain until it arrives. When he comes in he will remove the torpedo nearest to train, but the two torpedoes must be left on the rail as a caution signal to a following train.

"The recall of flagman is the most critical period, and when there is not a clear view of at least one-half mile, train must be moved forward a sufficient distance to insure safety before flagman is recalled. During foggy or stormy weather or in the vicinity of obscure curves or descending grades, or when other conditions require it, the flagman will increase the distance. When a train is flagged by a flagman the engineman must obtain a thorough explanation of the cause, stopping if necessary.

"(b) Should the speed of a train be reduced and its rear thereby endangered, making it necessary to check a following train before a flagman can get off, a lighted red fusee must be thrown on the track at intervals to insure the safety of the leading train.

"(c) When a flagman is sent out with specific instructions affecting the rights of trains, such instructions must be in writing.

"(d) When a flagman is sent to a station on a train, he will ride on the engine and engineman must stop and let him off at the first switch."

The commission orders the roads to print, distribute and enforce the rule, and to instruct all men in charge of trains; to have flagmen examined every six months on this and other rules. The examining officer must give the man a certificate and keep a record of all examinations. Every flagman must have served an apprenticeship as a flagman 30 days, and must have made at least two trips as learner over the line on which he is to serve.

COURT NEWS.

The Supreme Court of the United States this week sustained the Barker act of Arkansas, which requires railroads to furnish freight cars on request of shippers. The court ordered that the suit of the Iron Mountain road in the federal courts of that

state be dismissed. The court declined to annul the law as being a regulation of interstate commerce.

The Supreme Court of Wisconsin has rendered a decision sustaining the constitutionality of a law passed by the Wisconsin legislature in 1911, requiring railways to keep upper berths in the sleeping cars closed when they are not sold and the lower berths are occupied. The decision reversed a decision of the Dane county Circuit Court in a test case.

The Circuit Court at Baltimore, Md., holds that the Baltimore & Ohio cannot legally make a proposed issue of bonds—$62,500,000—without first securing the approval of the state public service commission; but says that the commission has not the authority to substitute its judgment for that of the directors of the railroad; it only has power to see that bonds are not issued for a fictitious or dishonest purpose.

The Supreme Court of the United States in a decision handed down this week by Justice Hughes, holds that grain in transit, stopped at Chicago for inspection, grading, etc., is, when removed from the railroad carrier to a private grain elevator, subject to the local state tax on grain placed in elevators. The decision applies only to the case in point and not to the general law that grain in transit, not at rest, is not subject to local tax.

Judge Martin, in the United States District Court at New York, February 19, dismissed indictments against George W. Sheldon and Henry W. Ackhoff, customs brokers, charged with having received rebates from the Lehigh Valley Railroad. It was shown that defendants had for nearly 30 years been salaried employees of the road and that the alleged rebates were really commissions given for extra services rendered. The prosecution had claimed that the money paid by the road had gone to shippers.

The federal court for Alaska has set aside certain indictments against an alleged "transportation trust" on the ground that the charges of discrimination presented by the government prosecutor must first be laid before the Interstate Commerce Commission. The attorney-general at Washington questions the soundness of the district court's view, and has applied to the Supreme Court of the United States to have the decision overruled. The attorney-general says that the Interstate Commerce Commission has exclusive primary jurisdiction in controversies between carriers and shippers, but not in controversies between the government and carriers or shippers.

The Supreme Court of the United States this week decided that irrespective of the provisions of the Interstate Commerce law, a person accepting gratuitous transportation from a railroad still is under the protection of state law prescribing the liability of carriers for injury or death by negligence. The decision was in the case of the heirs of Charles A. Schuyler, assistant chief clerk of the railway mail service, stationed at Ogden, Utah, killed in a train accident while riding free on his "commission" as a mail employee, in a mail car. The Southern Pacific claimed that he was a trespasser because its employees had no right to admit him to the car and, therefore it was not liable for his death. The court held Schuyler's heirs entitled to recover under state law.

The Commerce Court has rejected the motion of the Interstate Commerce Commission to dismiss the petition of the lumber tap lines in the Southwest. The court held that it has authority to review the decision of the commission and that it will proceed with the case. This case has been through unusual changes. An order was entered forbidding the trunk lines to make joint rates and through routes with the tap lines, it being held that the tap lines were owned by industrial companies and were merely plant facilities. The division of the rate was held to be a rebate. The tap lines appealed to the court, but were denied relief because the court decided that it did not have jurisdiction over a negative order of the commission. Representatives of the tap lines went to Congress and attempted to have the powers of the court altered so that it could review the law in any decision of the Interstate Commerce Commission. Congress took no action, but the commission in the meantime altered the form of the decision, whereupon the case was again taken to court. On the filing of this case the commission and the government both made a motion that the petition should be dismissed for want of jurisdiction. The court now holds it has jurisdiction and announces itself ready to proceed with the case.

Lemon Rate of $1 Sustained.

The Commerce Court has dismissed the appeal of the Atchison, Topeka & Santa Fe and other transcontinental lines, against the order of the Interstate Commerce Commission establishing a blanket rate of $1 per 100 lbs., on lemons from the Pacific coast to eastern destinations. The decision is in consonance with a former opinion of the Commerce Court, in which a similar order of the commission was annulled. The earlier decision of the commission had been based not on a finding that the rate of $1.15 was unreasonable in and of itself, but on the view of the commission that the shippers needed the reduction in order to meet Sicilian competition.

The Commerce Court, following a decision of the Supreme Court in a lumber case, held that the commission had no power to take into consideration the matter of Sicilian competition, but that it was its duty in the first place to determine whether the $1.15 rate was intrinsically unreasonable. When the commission reconsidered the case it found that, entirely apart from the matter of competition the $1.15 rate was unreasonably high, and it thereupon proceeded to reduce the rate.

The Commerce Court now holds that inasmuch as there was substantial testimony that $1 is a reasonable rate, and as there was no evidence to sustain the charge of arbitrary conduct on the part of the commission, and that as it was clear that the $1 rate was far in excess of the out-of-pocket expense of carrying the lemons, the railroads could not complain on the ground of confiscation, even if the rate did not yield its full proportion of the entire operating expenses of the roads.

Mileage Coupons in Georgia.

The county court at Atlanta, Ga., has issued an injunction against the enforcement of the recent order of the Georgia State Railroad Commission requiring the railroads to accept mileage coupons for passage on trains, from passengers getting on at certain stations within that state. The court approves the rule of the railroads requiring all such coupons to be presented at the ticket office, to be changed for trip tickets. The court thinks that the conditions printed on the mileage books are reasonable, and that there is no good ground for making the rule in Georgia different from that in other states, these coupons being valid in other states as well.

The traveling salesmen made a persistent demand for the suspension of the rule requiring coupons to be exchanged. In their response to the traveling men the railroads issued a statement which said, in part:

"An interchangeable mileage book may be used for obtaining transportation over any line party to the arrangement. The coupons from these books are equivalent to cash, and to safeguard their transmission to the treasurer of each railroad company, the requirement is made for the exchange of the coupons at ticket windows for transportation, thus causing the mileage coupons to be placed in the hands of bonded ticket agents who must account to the auditing department of each line for their value.

"The object of this requirement is to have one man, the ticket agent, handle the money and sell tickets, either for cash or coupons from an interchangeable mileage book, and thus make a record of what the company has sold; another man, the conductor, to collect the tickets, and thus make a record of their use, and thereby have an additional check against the agent, who must account for the purchase price either in cash or coupons. . . . Where the conductor lifts the coupons on the train he does not have the same facilities for safeguarding coupons, and should they become lost, the railroad honoring the mileage book would have no means of securing proper compensation.

"Attention is invited to the check system in department stores; the cash registers in small stores; the cashiers at hotels, restaurants, etc., and hundreds of other devices for the purpose of proper accounting.

"The exchange regulation has been the subject of judicial review before railroad commissioners and state courts, and the reasonableness of the requirements has been sustained."

MANILA RAILROAD, PHILIPPINE ISLANDS.—On June 30, 1912, the Manila Railroad Company had 450 miles of line in operation and 10 miles of line built, but not in operation. This company has been authorized to build 350 miles of new lines.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF DECEMBER, 1912.

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses				Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total. inc. misc.	Maintenance Way and structures.	Maintenance Of equipment.	Traffic.	Transportation.	General.	Total.				
Atlantic & St. Lawrence	167	$137,530	$20,242	$170,660	—$45,911	35,129	$5,953	$101,863	$6,863	$103,897	$66,763	.....	$16,152	$50,611	$43,492
Buffalo & Susquehanna *Railroad*	265	134,940	8,454	147,864	27,617	20,420	1,149	53,188	6,150	108,524	39,340	.....	2,200	37,140	—1,742
Buffalo & Susquehanna *Railway*	91	36,992	8,749	48,139	11,733	26,089	430	23,795	2,816	64,863	—16,724	—$6	1,500	—18,230	—9,201
Detroit, Grand Haven & Milwaukee	191	167,997	52,284	265,474	43,048	27,681	7,266	124,406	5,394	207,795	57,679	—248	2,953	54,478	34,743
Grand Trunk Western	347	443,840	226,009	718,573	54,176	85,731	23,663	289,682	23,379	476,631	241,942	—1,551	29,877	210,514	—17,433
Louisiana Ry. & Nav. Co	351	164,232	25,589	201,052	19,039	23,988	5,513	81,535	7,167	137,242	63,810	.....	5,500	58,310	22,430
New Orleans Great Northern	283	93,411	33,051	137,193	20,651	13,417	2,190	41,981	5,778	84,017	53,176	—49	3,161	48,966	12,707
Ulster & Delaware	129	56,506	17,278	77,998	8,420	13,296	894	38,131	2,762	63,503	14,495	232	3,300	11,427	5,909
SIX MONTHS OF FISCAL YEAR, 1913.															
Atlantic & St. Lawrence	167	$555,570	$180,215	$798,838	$170,203	$128,869	$25,486	$390,699	$22,039	$737,296	$61,542	.....	$52,721	$8,821	$34,722
Buffalo & Susquehanna *Railroad*	265	826,653	53,666	905,922	178,925	131,415	7,317	305,050	35,576	658,283	247,639	.....	13,200	234,439	57,406
Buffalo & Susquehanna *Railway*	91	254,163	62,803	331,890	66,623	163,232	2,873	134,281	16,000	383,009	—51,119	$131	9,000	—59,988	—26,925
Detroit, Grand Haven & Milwaukee	191	799,997	375,284	1,358,366	366,662	153,585	41,929	631,267	29,895	1,223,338	135,028	—375	17,718	116,935	—150,440
Grand Trunk Western	347	2,313,840	1,239,009	3,791,353	450,446	507,257	125,107	1,510,863	96,767	2,690,440	1,100,913	—8,461	179,263	913,189	34,478
Louisiana Ry. & Nav. Co	351	781,500	159,685	1,001,551	127,467	115,078	34,741	389,066	37,319	703,671	297,880	.....	33,000	264,880	—44,345
New Orleans Great Northern	283	577,173	187,473	830,996	131,665	95,758	14,384	251,914	39,656	533,377	297,619	—398	12,212	285,009	17,516
Ulster & Delaware	129	363,254	245,755	640,783	85,683	77,320	8,394	252,491	14,926	438,814	201,969	336	19,800	182,505	—16,454

Railway Officers.

Executive, Financial and Legal Officers.

H. W. MacKenzie, assistant to comptroller of the Seaboard Air Line at Portsmouth, Va., has been elected comptroller, succeeding T. W. Roby, deceased.

The offices of Rollin H. Wilbur vice-president and general manager, and E. M. Kuntz, auditor, of the Lehigh & New England, have been transferred from Philadelphia, Pa., to South Bethlehem.

J. C. Nelms, Jr., auditor of the Kinston, Carolina Railroad & Lumber Co., at Norfolk, Va., has been appointed auditor also of the Carolina Railroad, formerly the Kinston & Snow Hill, with headquarters at Norfolk.

A. D. Lightner, general agent of the executive department of the Frisco Lines at New Orleans, La., has been elected vice-president of the New Orleans, Texas & Mexico, with headquarters at New Orleans.

M. C. Byers, chief engineer of operation of the St. Louis & San Francisco, has been appointed assistant to the president of the Great Northern, with headquarters at St. Paul, Minn., effective March 1. F. G. Jonah, chief engineer of construction, will assume the duties of chief engineer of operation, also.

Edson J. Chamberlin, president of the Grand Trunk and the Grand Trunk Pacific with headquarters at Montreal, Que., who was recently elected president also of the Central Vermont has been elected president also of the Southern New England Railroad Corporation, the Southern New England Railway Company and the Central Vermont Transportation Company succeeding E. H. Fitzhugh, resigned.

Julius Kruttschnitt, chairman of the executive committee and director of maintenance and operation of the Southern Pacific, with headquarters at New York, has been elected also president, director and ex-officio member of the executive committee of the Pacific Mail Steamship Company, succeeding R. S. Lovett. Hugh Neill, secretary of the Southern Pacific, with office at New York, has been elected secretary also of the Pacific Mail Steamship Company, succeeding Alex. Millar, resigned.

Operating Officers.

E. F. Boyle has been appointed an assistant superintendent of the Galveston, Harrisburg & San Antonio, El Paso division, with office at El Paso, Tex.

William Ward has been appointed assistant division superintendent of the Chicago, St. Paul, Minneapolis & Omaha, with office at Spooner, Wis.

D. Gilmour has been appointed superintendent of the Montreal, Que., terminals of the Grand Trunk, succeeding R. W. Scott, relieved on account of ill health.

J. M. Shea, general superintendent of the Seaboard Air Line, with headquarters at Portsmouth, Va., has resigned and his former position has been abolished.

J. T. Connor has been appointed assistant superintendent of the Galveston, Harrisburg & San Antonio, with office at San Antonio, Tex., succeeding J. E. McLean, resigned.

J. M. Teachworth has been appointed assistant superintendent of the Houston & Texas Central, Houston East & West Texas, and Houston & Shreveport, with headquarters at Houston, Tex., to succeed R. A. Crofton, resigned.

The officers of E. H. Shipman, superintendent, and J. R. Brown, car accountant, of the Lehigh & New England at Bethlehem, Pa., and W. E. Baily, trainmaster at Pen Argyle, have been transferred to South Bethlehem.

J. W. Walters has been appointed assistant superintendent of the St. Louis, Brownsville & Mexico, instead of trainmaster as previously stated, with headquarters at Kingsville, Tex. The office of trainmaster, formerly held by E. S. Heyser, is abolished.

William Hayes, superintendent and general freight and passenger agent of the Kinston, Carolina Railroad & Lumber Company, at Kinston, N. C., has been appointed general superintend-

ent also of the Carolina Railroad, formerly the Kinston & Snow Hill, with office at Kinston.

A. B. Warner, engineer of maintenance of way of the Third district of the Chicago, Rock Island & Pacific, with headquarters at El Reno, Okla., has been appointed superintendent of the Southern division of the Chicago, Rock Island & Gulf, with office at Ft. Worth, Tex., succeeding C. L. Ruppert, promoted.

Traffic Officers.

Wendall H. Stallings has been appointed soliciting agent of the Louisville & Nashville with office at Birmingham, Ala., succeeding J. V. McCullough, resigned.

The office of T. J. Fretz, general freight and passenger agent of the Lehigh & New England, has been transferred from Bethlehem, Pa., to South Bethlehem.

J. F. Dalton has been appointed general freight and passenger agent of the Carolina Railroad, formerly the Kinston & Snow Hill, with headquarters at Norfolk, Va.

Thomas J. Kay has been appointed traveling passenger agent of the Union Pacific system, with headquarters at Detroit, Mich., in place of J. O. Goodsell, transferred.

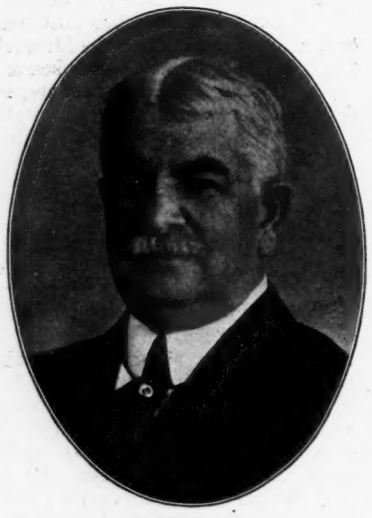
George R. Bierman, assistant city passenger and ticket agent of the Union Pacific at Omaha, Neb., has been appointed traveling passenger agent, with headquarters at Chicago.

C. E. Benjamin, general tourist agent of the Canadian Pacific, with office at Montreal, Que., has been appointed general passenger agent of the Pacific Steamship service, with office at Montreal.

H. B. Bryning, traveling immigration agent of the Northern Pacific, with office at Kansas City, Mo., has been appointed district passenger agent of the Chicago Great Western at Kansas City, to succeed L. F. McFarland, resigned.

W. H. Kirkwood has been appointed tariff inspector of the Louisiana lines of the Southern Pacific, with headquarters at New Orleans, La., in place of L. C. Bouchard, who has been appointed traveling freight and passenger agent, with headquarters at New Iberia, La., succeeding W. H. Stakelum, transferred to Lake Charles, La., as division freight and passenger agent.

George W. Boyd, who has been appointed passenger traffic manager of the Pennsylvania Railroad, with headquarters at Philadelphia, was born at Indianapolis, Ind., August 1, 1848. He began railway work in 1863 in the freight department at Indianapolis of the Cleveland, Columbus, Cincinnati & Indianapolis, now the Cleveland, Cincinnati, Chicago & St. Louis, and for several years he served as clerk of the freight department. In June, 1872, he was appointed cashier of the passenger department of the Pennsylvania Railroad, remaining in that position until January, 1874, when he was promoted to chief clerk. From January, 1882, to June, 1903, he was assistant general passenger agent of the same road and then was promoted to general passenger agent, which position he held at the time of his appointment as passenger traffic manager. Mr. Boyd has been an uncompromising foe of the ticket scalper and has often advocated anti-scalping laws before committees of Congress and the legislatures of many states. He has consistently maintained the principle that pleasure travel, under the personally-conducted system, is the legitimate business of the railroad companies, and does not belong to independent promoters.



G. W. Boyd.

W. S. Basinger, assistant to director of traffic of the Southern Pacific with headquarters at New York, and formerly holding the same position on both the Union Pacific and the Southern Pacific, has been appointed general passenger agent of the Union Pacific, with headquarters at Omaha, Neb., effective March 1. He was born in 1872 at Savannah, Ga., and graduated from the University of Georgia in 1890. The following year he became clerk in the auditing department at Kansas City, Mo., of the Kansas City, Fort Scott & Memphis, now a part of the St. Louis & San Francisco, and from 1891 to 1897, was a clerk in the freight department of the Union Pacific, at Kansas City. He then went to the Leavenworth, Kansas & Western, now a part of the Union Pacific, as general freight and passenger agent, and from 1903 to 1905, was superintendent, treasurer and secretary of that road with headquarters at Leavenworth, Kan. He was then trainmaster on the Union Pacific for two years, and was made assistant general passenger agent at Omaha, Neb., of the same road in 1907. From 1911 to 1912, he was assistant to director of traffic of the Union Pacific and the Southern Pacific at Chicago, and then at New York. On February 6 he resigned from the Union Pacific as assistant to director of traffic and now he goes back to the Union Pacific as general passenger agent as above noted.

James Roberts Wood, passenger traffic manager of the Pennsylvania Railroad, with headquarters at Philadelphia, Pa., whose retirement on March 1, under the pension rules of the company has been announced in these columns, was born at Auburn, N. Y., on February 9, 1843. He began railway work in 1869, as secretary to the superintendent at Creston, Iowa, of the Burlington & Missouri River, now a part of the Chicago, Burlington & Quincy. From this position he was advanced to trainmaster, which he held until 1871, when he was appointed general western passenger agent of the same road, with office at Chicago. In 1873 he became general ticket agent of the same road in Nebraska, and then for a short time was western land and passenger agent. His next position was general agent of the Michigan Central and the Chicago & West Michigan, at Grand Rapids, Mich. In 1876 he was appointed assistant superintendent of the Michigan Central, at Jackson, Mich., and in 1878 he returned to Chicago as assistant general passenger agent of the same road. A few months later he went to the Chicago, Burlington & Quincy, as general passenger agent of that system. He remained in this position until April, 1881, when he was appointed general passenger agent of the Pennsylvania Railroad, and on June 1, 1903, was promoted to passenger traffic manager, from which position he retires on March 1. In April, 1890, Mr. Wood was selected as chairman pro tempore of the Passenger Committee of the Trunk Line Association, and held the position until the election of a permanent chairman, in August of the same year, having declined the permanent chairmanship. He has also served a term as president of the American Association of General Passenger and Ticket Agents. It was upon Mr. Wood's initiative that the first "limited" train, in the sense of exclusive accommodations and high speed, was inaugurated in this country. He has aided and encouraged every reform which had for its object the elevation and expansion of the passenger business.

J. R. Wood.

George W. Boyd, general passenger agent of the Pennsylvania Railroad, with office at Philadelphia, Pa., has been appointed passenger traffic manager, to succeed J. R. Wood, who retires from active service on February 28, under the pension rules of the company. Coincident with the appointment of a new passenger

traffic manager the passenger department has been reorganized. D. N. Bell and J. P. Anderson, formerly assistant general passenger agents, have been appointed general passenger agents. Heretofore, Mr. Boyd has been the only general passenger agent on the Lines East. Under the new organization, one general passenger agent will devote his time to developing travel local to the Pennsylvania Railroad and the other to building up the through passenger business. Division passenger agencies have been created at New York, at Philadelphia, at Harrisburg, at Pittsburgh, at Williamsport, at Buffalo and at Baltimore. To each one of the division passenger agents will be assigned a particular territory, and it will be his duty to give his personal attention to securing the comfort and convenience of the people in his territory. This plan, which requires the division passenger agent to make a study, more careful than ever made before, of the comfort and convenience of travel, will, it is thought, bring the management of the company into the closest possible touch with the traveling public. C. Studds, R. J. DeLong and R. M. Pile have been appointed assistant general passenger agents; O. T. Boyd, New York; F. B. Barnitz, Philadelphia; A. E. Buchanan, Harrisburg; E. Yungman, Pittsburgh; David Todd, Williamsport; B. P. Fraser, Buffalo, and William Pedrick, Jr., Baltimore, have been appointed division passenger agents, and the following have been appointed district passenger solicitors: R. L. Stall, W. P. Harriman and W. V. Kibbe, New York; F. E. Binns, Brooklyn, N. Y.; C. E. McCullough, Newark, N. J.; D. M. Sheaffer, Philadelphia, Pa.; A. C. Weile, Reading; C. A. B. Cooper, Erie; S. B. Newton, Altoona; T. L. Lipsett, Washington, D. C.; N. S. Longaker, Wilmington, Del., and C. R. Rosenberg, Atlantic City, N. J.

Engineering and Rolling Stock Officers.

R. M. Garnett has been appointed roadmaster of the St. Louis, Brownsville & Mexico, with headquarters at Kingsville, Tex.

The office of C. W. Brown, engineer maintenance of way of the Lehigh & New England, has been transferred from Bethlehem, Pa., to South Bethlehem.

W. H. Evans has been appointed district master mechanic, Second district, of the Canadian Pacific, British Columbia division, with headquarters at Vancouver, B. C.

D. S. Terry has been appointed a construction engineer of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, Ohio, succeeding F. W. Smith, resigned.

Hans Helland, superintendent of maintenance of way of the San Antonio & Aransas Pass at Yoakum, Tex., has been appointed construction engineer, with headquarters at San Antonio, Tex.

George McCormick has been appointed assistant general manager (mechanical) of the Galveston, Harrisburg & San Antonio, the Houston & Texas Central, the Houston East & West Texas, the Houston & Shreveport, and the Texas & New Orleans, and superintendent of motive power and machinery of the Morgan's Louisiana & Texas Railroad & Steamship Company and the Louisiana & Western Railroad, with headquarters at Houston, Tex., in place of J. W. Small, resigned.

H. W. Ridgway, who recently was appointed superintendent of the motive power and car department of the Colorado & Southern, with headquarters at Denver, Colo., was born July 17, 1866, at Delaware Water Gap, Pa. He was educated in the common schools and began railway work in November, 1881, as machinist apprentice with the Denver & Rio Grande. From May to December, 1887, he was successively journeyman and foreman of the Mexico Central at Mexico City, and then for four years was with the Denver & Rio Grande as a journeyman and gang foreman. He returned to the Mexico Central in 1893, and until 1901, was foreman and master mechanic. In February of the latter year he went to the El Paso & Northeastern as superintendent of machinery, and from April, 1903, to February 1, 1904, he was superintendent of the contract shop. He then became superintendent of shops of the Mexican Central at Aguascalientes, Mex., where he remained until December 1, 1905. On January 1, 1906, he was appointed master mechanic of the Colorado & Southern and the Atchison, Topeka & Santa Fe at Denver, Colo., from which position he has been promoted to that of superintendent of motive power and car department, as above noted.

Purchasing Officers.

James E. Kilborn has been appointed purchasing agent and storekeeper of the Rutland Railroad, and purchasing agent of the Rutland Transit Company, with office at Rutland, Vt., succeeding A. E. Douglas, resigned.

OBITUARY.

William Singer, Jr., formerly an attorney for the Southern Pacific, died at San Francisco, Cal., on February 12, aged 63 years.

Robert Bicknell Seymour, formerly chief engineer of the Chicago, Indiana & Southern, died at his home in Oak Park, Chicago, on February 23, at the age of 53 years.

Urias J. Fry, who had been superintendent of telegraph of the Chicago, Milwaukee & St. Paul system since 1888, died at his home in Milwaukee, Wis., on February 22, aged 65 years.

Henry A. Williams, assistant to general superintendent of the Southern Railway, died recently at his home in Columbia, S. C., at the age of 52. Mr. Williams began his railroad career as a brakeman.

John J. Cairns, passenger agent of the Chicago, Milwaukee & St. Paul, at Chicago, died in that city on February 18, as result of injuries received when he was struck by a train on the Northwestern Elevated Railroad the evening before. Mr. Cairns was 60 years old.

William N. D. Winne, comptroller of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, died on February 24 in Florida. He was born October 11, 1850, at Schenectady, N. Y., and was educated in the public schools of his native town and at Madison, Wis., and in private schools at Milwaukee. He began railway work in 1863 as junior clerk in the auditor's office of the Milwaukee & Prairie du Chien and continued with that road until its absorption by the Chicago, Milwaukee & St. Paul. From September, 1882, to September, 1890, he was assistant general auditor of the Chicago, Milwaukee & St. Paul. He became general auditor in 1890, and was appointed comptroller in July, 1910.

Patrick Tyrrell, ticket auditor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, died on February 22 from a stroke of apoplexy. He was born on April 6, 1838, in Ireland and began railway work in 1855. From then until October, 1865, he held various positions as clerk on the Milwaukee & Mississippi, afterwards the Milwaukee & Prairie du Chien, now a part of the Chicago, Milwaukee & St. Paul. In October, 1866, he was appointed general bookkeeper of the Chicago, Milwaukee & St. Paul, remaining in that position until July, 1869, when he became auditor of the Western Union Railroad, also now a part of the St. Paul. From July, 1879, to September, 1882, he was general clerk in the auditing department of the Chicago, Milwaukee & St. Paul, and since September, 1882, had been ticket auditor.

Charles E. Gossett, general master mechanic of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., died at Rochester, Minn., on February 19, aged 44 years. Mr. Gossett was born on January 25, 1869, in Kentucky, and was educated at the Missouri State University. He had been in railway service since 1886, when he began as machinist helper with the Wabash, St. Louis & Pacific. From 1889 to 1901, he was a locomotive fireman on the Hannibal & St. Joseph, locomotive engineer on the same road, the Wabash and the Chicago, Rock Island & Pacific. He was then until March, 1905, road foreman of equipment of the latter road, when he was made master mechanic. In August, 1908, he went to the Iowa Central as master mechanic; two years later he was appointed master mechanic of the Minneapolis & St. Louis, and on January 1, 1912, he was promoted to general master mechanic of that road.

RAILROAD MILEAGE IN THE PHILIPPINES.—The construction has been authorized of 1,097 miles of new line in the Philippine Islands. The total mileage in operation is now 641 miles.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Cincinnati, New Orleans & Texas Pacific has ordered 10 mikado locomotives from the Baldwin Locomotive Works and 7 Pacific type locomotives from the American Locomotive Company.

P. Welch has ordered 1 oil burning consolidation locomotive from the American Locomotive Company. The dimensions of the cylinders will be 19 in. x 28 in.; the diameter of the driving wheels will be 57 in., and the total weight in working order will be 170,000 lbs.

The Detroit Terminal Railroad has ordered 5 six-wheel switching locomotives from the American Locomotive Company. These locomotives will be equipped with superheaters, will have 21 in. x 28 in. cylinders, 57 in. driving wheels, and in working order will weigh 170,000 lbs.

The Missouri Pacific has ordered 7 Mountain type locomotives and 5 Pacific type locomotives from the American Locomotive Company. The dimensions of the cylinders of the Mountain type locomotives will be 27 in. x 28 in.; the diameter of the driving wheels will be 63 in., and the total weight in working order will be 294,000 lbs. The Pacific type locomotives will have 26 in. x 26 in. cylinders, 73 in. driving wheels, and in working order will weigh 258,000 lbs.

CAR BUILDING.

The Chicago & Western Indiana is in the market for 300 ballast cars.

The Chicago, Rock Island & Pacific has ordered 50 caboose cars from the Whipple Car Company.

The Rutland has ordered 3 smoking cars, 2 coaches, 2 baggage cars and 1 mail and baggage car from the Osgood Bradley Car Company.

The Pennsylvania Railroad has ordered 1,000 refrigerator cars and 500 steel and wood gondola cars from the American Car & Foundry Company, and 805 steel and wood gondola cars from the Standard Steel Car Company.

The Cincinnati, New Orleans & Texas Pacific has ordered 100 gondola cars and 50 hopper cars from the Cambria Steel Company, 100 box cars from the American Car & Foundry Company and 5 dining cars from the Barney & Smith Car Company.

The Harriman Lines have recently placed a large order for freight cars, as mentioned in the *Railway Age Gazette* of January 31, February 14 and February 21. The correct division of this order is as follows: 2,280 drop bottom gondola cars, 200 hopper bottom gondola cars and 203 tank cars from the Pressed Steel Car Company; 1,000 box cars, 800 automobile cars and 110 caboose cars from the Standard Steel Car Company; 2,290 box cars from the American Car & Foundry Company; 2,050 single deck stock cars and 3,100 box cars from the Pullman Company; and 800 work cars and 500 flat cars from the Bettendorf Axle Company.

IRON AND STEEL.

The Central of New Jersey is in the market for about 800 tons of structural steel.

General Conditions of Steel.—The output of steel continues to be at the same high rate as in January, and if the total output for the current month falls below that of January, it will only be due to the fact that February is the shorter month. Orders for new business in some branches of the industry have recently shown increases since the first of January. The heavy orders for freight cars have also called for a considerable tonnage of steel. Rail buying during February has been smaller than usual, but this was to be expected after the unusually heavy contracts for 1913 delivery placed in the second half of 1912.

Supply Trade News.

F. R. Wadleigh has opened offices in the Bank of Commerce building, Norfolk, Va., as consulting engineer in all matters in connection with the preparation and purchase and use of coal.

William Thornburgh has been appointed general manager sales of the Standard Asphalt & Rubber Company, Chicago, with jurisdiction over the waterproofing, engineering, mastic floor and paving departments.

Michael Ehret, president of the Ehret Magnesia Manufacturing Company, Philadelphia, Pa., and chairman of the board of directors of the Barrett Manufacturing Company, New York, died at his home in Philadelphia on February 17, at the age of 75.

Leigh Best, vice-president of the American Locomotive Company, New York, in charge of finance, has been given full charge of the automobile department of this company in addition to his present duties. It is the purpose of the company to segregate the automobile department from the locomotive department so far as is practicable. Mr. Best was born at Chatham, N. Y., on November 4, 1867. He received a high school education and in 1892 entered the legal department of the New York Central Lines, with office in New York. Later he was made assistant to the president, while S. R. Callaway was president. In June, 1901, Mr. Callaway resigned his position to become president of the American Locomotive Company and brought Mr. Best with him as secretary of that company. Mr. Best retained that position until June, 1904, when he was made third vice-president in charge of financial, accounting, legal and corporate matters, which position he still holds. In future Mr. Best will divide his time between his present office at 30 Church street and his new office at 1886 Broadway.

As announced in last week's issue, at a recent meeting of the directors of the Weir Frog Company, Cincinnati, Ohio, O. DeG. Vanderbilt, Jr., was elected president, succeeding B. W. Rowe, who was elected chairman of the board of directors. Mr. Vanderbilt is a son-in-law of the late Col. L. C. Weir, who was once president of the Adams Express Company, and was later president of the Weir Frog Company, until his death in 1899. Mr. Vanderbilt's interest in the past have been in the East, and his headquarters at New York City, but he has spent the past four or five months in Cincinnati, taking active charge of extensive improvements and additions to the plant at Cincinnati, which will increase the capacity from 25 to 35 per cent. The company has increased its floor space for manufacturing about 16,000 sq. ft., and the space for the storage of raw material has been nearly doubled.

O. DeG. Vanderbilt, Jr.

TRADE PUBLICATIONS.

Mikado Locomotives.—Bulletin number 1012, issued by the American Locomotive Company, 30 Church street, New York, deals with the Mikado locomotives of the Chesapeake & Ohio. In comparison with locomotives of the consolidation type these show a saving in coal per ton mile of 14 per cent. and 9 per cent. saving in water per ton mile, while increasing the train loads 50 per cent. Drawings showing the side elevation and clearance diagram of the locomotives are given and also a dynamometer car record made with a train of 7,590 tons.

Railway Construction.

BOSTON & MAINE.—Favorable action has been taken by the Vermont legislature on two bills of the Boston & Maine granting that company permission to construct two connecting links parallel with the tracks of the Central Vermont, a Grand Trunk subsidiary, to complete its line down the Connecticut river valley to Massachusetts. One bill passed by the house in concurrence with the senate provides for an extension of the Sullivan County Railroad from Windsor to White River Junction. The other bill, passed by the senate, provides for an extension of the Vermont Valley Railroad from Brattleboro to the Massachusetts line at South Vernon. These connecting links will probably not be built as long as the present agreement between the Grand Trunk and the Boston & Maine for the joint use of the existing lines remains in effect.

CANADIAN PACIFIC.—An officer writes that appropriations have been made for new lines and improvements on the western lines as follows: In Manitoba, a branch line from Snowflake westerly, 9 miles, and from Gimli to Tiverton, 26 miles; in Saskatchewan, branch from Weyburn, westerly, 145 miles, and a new yard at Assiniboia. In Alberta, additional tracks at Dunmore, at Calgary, at Strathcona, at Edmonton and at Wetaskiwin; also branch lines from Coronation to Sedgewick, 25 miles, and from Lacombe east to Kerrobert, Sask., 86 miles; Stirling easterly 25 miles, Suffield, southwesterly, 25 miles, and from Bassano to Empress, 118 miles. In British Columbia, standardization of the Kaslo & Slocan from Whitewater to Kaslo, 17 miles, and on the Kootenay Central, construction from Skookumchuck to mile 60, and from mile 42 to mile 60 south of Golden. New double tracks will be constructed as follows: Kemnay, Man., to Virden, 40 miles; Whitewood, Sask., to Broadview, 15 miles; Broadview, Sask., to Grenfell, 16 miles; Indian Head, Sask., to Regina, 44 miles; Chaplin, Sask., to Swift Current, 57 miles; Swift Current to a junction with the Swift Current northwesterly branch, 6 miles; Gleichen, Alta., to Shepard, 40 miles, and double tracking will be completed on the line between Vancouver, B. C., and Ruby Creek, 81 miles. Part of this latter work has been completed and is now in operation.

Bids are wanted by J. G. Sullivan, chief engineer Western lines of the Canadian Pacific, Winnipeg, Man., up to noon April 15, for the clearing, grubbing and grading of a division of the main line in the Selkirk mountains, from Six Mile Creek to Glacier, 17 miles. This work includes a double track tunnel about 28,000 ft. long. Plans and specifications are on file at the offices of J. G. Sullivan and of F. F. Busteed, engineer grade revision, Kamloops, B. C.

The Canadian Pacific has appropriated $16,000,000 for construction work to be carried out on its eastern divisions this year. Of this amount, about $10,000,000 will be used to complete work commenced last summer, including the new Lake Shore line, and extensions from St. Johns, Que., to Farmham Junction and branches in the east end of Montreal. The greater part of the new work will consist of double tracking the new eastern lines, involving the expenditure of nearly $6,000,000. The main line from Islington to Guelph Junction, on the London (Ont.) division, will be double tracked for 50 miles. It is also proposed to double-track some of the main line between Ramford, Ont., and Port Arthur, and eventually to double-track the entire line, 563 miles, in order to facilitate the handling of grain.

CHESAPEAKE & OHIO.—An officer writes that contracts have been let and work is now under way on a 7.9-mile extension up Island Creek, W. Va. This is all of the construction that is proposed at this time, in that section.

DETROIT, BAY CITY & WESTERN.—According to press reports a contract has been given to the Bay County Construction Company, Bay City, Mich., to build the ten miles branch north from Akron, Mich., to Sebewaing (November 15, 1912, p. 973).

GRAND TRUNK PACIFIC.—The programme of construction for 1913, it is understood, includes the completion of the British Columbia section of the main line. The gap between the eastern and western sections in British Columbia is now 426 miles, and work on this section is under way throughout its entire length. Track has been laid to the Shuswap river, 1,123 miles west of Winnipeg, Man., and 154 miles east of Fort George. A steel structure spanning this river will be placed in position as soon as footings upon which work has commenced have been completed. East of Prince Rupert track has been laid to mile 195 from the Pacific coast. Between that point and Aldermere several steel bridges will be erected, and some grading must be done. From Aldermere, easterly, the grade continues to the Endaka river, 341 miles from Prince Rupert; there is then a gap of 126 miles to Fort George, upon which clearing work is being done. The company will enter the towns of Brandon, Moose Jaw, Weyburn, Battleford and Calgary this year, and will push forward with all possible speed important extensions already undertaken. This includes finishing the Weyburn branch and Regina boundary line, securing terminals in Moose Jaw for the Regina-Moose Jaw branch, which is finished to a point just north of Moose Jaw, ballasting the Battleford branch, and the construction into Calgary of the line from Tofield. On the line from Regina to the international boundary, grading is finished as far as Frobisher, 136 miles from Regina, and track has been laid to Hill Hall, 106 miles, and 90 per cent. of the grading is completed on the remaining section between Frobisher and the United States. The grade on the Tofield-Calgary branch has been finished to Calgary. Track is laid as far as mile 176, and ballasting will soon be commenced along this line until Bow river is reached, and on the completion of a steel bridge at that point, track laying will be continued to Elbow river, at which point another steel bridge will be put in place. Concrete piers are ready for both bridges. Terminals are now being prepared and it is expected that the line will be opened for the operation of passenger trains into Calgary by next August.

GULF, TEXAS & WESTERN.—An officer writes that there is no truth in the report that an extension is to be built from Salesville, Texas, south to Mineral Wells, about eight miles. The company has just completed an extension from Jacksboro south to Salesville, and has trackage rights for passenger trains over the Weatherford, Mineral Wells & Northwestern to Mineral Wells, and for freight trains to Weatherford. (February 14, page 313.)

KERRY TIMBER COMPANY'S LINES.—According to press reports the Kerry Timber Company will build a logging line in Oregon from Wood's Landing on the Columbia river, south to the Nehalem valley, 30 miles.

MIDDLE TENNESSEE.—According to press reports this company has surveys made for an extension from Mt. Pleasant, Tenn., southeast via Pulaski to Huntsville, Ala., about 70 miles.

MONTOUR RAILROAD.—This company, which operates a line from Montour Junction, Pa., southwest to North Star 12.5 miles, has given a contract to John Marsch, Chicago, to build a 30-mile extension from North Star, through a coal section in Washington and Allegheny counties to a point south of Homestead. (January 31, page 231.)

NORTHERN CALIFORNIA RAILROAD & NAVIGATION COMPANY.—Incorporated in California with a capital of $1,100,000, to build railroads. The incorporators include G. W. Bartle, S. Swinson, O. G. Bartle, J. D. Rhodes, R. H. Hayworth and M. C. Messick.

OCILLA SOUTHERN.—This company will build an extension, it is said, from the southern terminus at Nashville, Ga., east about 50 miles to Waycross.

ST. LOUIS-KANSAS CITY (Electric).—President Nevin of this company, which was organized some time ago to build a double-track line from St. Louis, Mo., west to Kansas City, about 250 miles, is quoted as saying that work had been started and would be pushed to completion. The contract for building the line has been given to the National Contracting Company, Norfolk, Va.

SULLIVAN COUNTY.—See Boston & Maine.

TEMPLE, NORTHWESTERN & GULF.—According to press reports this is the new name of the Temple-Northwestern, which was organized some time ago to build from Temple, Tex., northwest via Gatesville, Hamilton and Comanche. Work on the line was suspended about two years ago, and it is understood will be resumed by May 1. A contract has been entered into by the new owners to begin construction within five months, and to complete the line to Gatesville, about 35 miles,

within two years. Grading has been finished between Gatesville and Temple, and about four miles of track has been laid from Temple. Residents of Houston are back of the project.

TEMPLE-NORTHWESTERN.—See Temple, Northwestern & Gulf.

TENNESSEE ROADS.—According to press reports residents of Baileyton, Tenn., are back of a project to build a line from Baileyton, south to Greenville, about 15 miles. L. P. Campbell may be addressed.

TRANS-APPALACHIAN.—Incorporated in West Virginia, it is said, to build from Parkersburg, W. Va., southeast along the little Kanawha and Elk rivers to or near Marlinton in Pocahontas county, thence to a point in Virginia. The company proposes to develop timber lands in Pocahontas county, W. Va., and in Bath county, Va. The line may eventually be extended to a connection with the Chesapeake & Ohio at Covington, Va. H. M. Lockridge, Huntersville, W. Va., and R. S. Turk, Staunton, Va., may be addressed.

VERMONT VALLEY.—See Boston & Maine.

RAILWAY STRUCTURES.

CLINTON, IA.—The Chicago & North Western has prepared plans for new repair shops to cost approximately $500,000, on which work is to be started this spring.

CONCORD, N. C.—Construction work has been begun on the new passenger station for the Southern at Concord. It will be of brick construction with stone trimmings and tile roof and will be steam heated. It will be 128 ft. x 32 ft. 6 in. and will include ample waiting rooms and modern conveniences for passengers, as well as office, baggage and express rooms. The old passenger station has been moved and converted into a freight office. The improvements at Concord also include the construction of concrete platform, macadam driveway and necessary track changes. Contract for the construction of the new passenger station has been given to J. A. Jones, of Charlotte, N. C., and contract for the installation of heating system has been awarded to the Hess & Rogers Engineering Company, Washington, D. C. (December 27, p. 1285.)

DES MOINES, IA.—The Chicago, Rock Island & Pacific is planning to build new repair shops, a roundhouse and additional yards on the east side of the city.

FORT WILLIAM, ONT.—An officer of the Canadian Pacific writes that appropriations for new improvements include the following: In Ontario, a 6-stall addition to the roundhouse, increase in the elevator capacity, and extensions to freight car repair shed at Fort William; at Kenora 6-stall addition to the roundhouse. In Manitoba, 5-stall addition to the roundhouse at Minnedosa. In Saskatchewan, 4-stall addition to the roundhouse at Arcola; in Alberta, an overhead bridge at Strathcona; 6-stall addition to the roundhouse at Alyth; a 2-stall addition to the roundhouse and 50 ft. addition to the freight shed at Lacombe.

JACKSON, MICH.—The Michigan Central is planning extensive additions to its shops, including an addition 250 ft. long to the main shop building, a new 30-stall roundhouse and a new blacksmith shop.

JACKSON, MISS.—The Illinois Central is to rebuild at once its freight house which was destroyed by fire recently.

LEXINGTON, VA.—The Baltimore & Ohio has given a contract to J. J. Walsh & Sons, contractors, of Baltimore, Md., for the construction of a modern passenger station at Lexington. The present passenger station will be completely overhauled and remodeled and the freight house platform will be extended.

LOS ANGELES, CAL.—The Southern Pacific has begun the work of clearing the site for a large new passenger station to replace the present Arcade station.

STAUNTON, VA.—An officer of the Chesapeake & Ohio writes regarding the reports, that a freight station is to be built at Staunton, that while the question has been under consideration, nothing definite has yet been decided in regard to the construction of the station.

Railway Financial News.

CAROLINA RAILROAD.—This company has taken over the Kinston & Snow Hill.

DELAWARE, LACKAWANNA & WESTERN.—Harold S. Vanderbilt has been elected a director, succeeding S. S. Palmer, deceased.

DENVER & SALT LAKE.—This company, which is the successor of the Denver, Northwestern & Pacific, has sold $488,000 5 per cent. equipment trust certificates. The securities cover the purchase of 300 steel gondola cars, 100 box cars, two Mallet locomotives and 50 other pieces of equipment.

The Denver & Salt Lake will have about $7,500,000 first mortgage 5 per cent. bonds and $2,000,000 adjustment income bonds outstanding. When arrangements have been finally completed for taking over the road of the Denver, Northwestern & Pacific, the $10,000,000 stock of the new company will be held in a voting trust for five years.

DENVER, NORTHWESTERN & PACIFIC.—See Denver & Salt Lake.

GALVESTON, HENDERSON & HOUSTON.—E. T. Jeffries has been elected a director, succeeding George J. Gould, resigned.

Speyer & Co. have bought $2,000,000 first mortgage 5 per cent. bonds of 1913-1933 or 1938. This will provide for refunding an equal amount of first mortgage bonds maturing April 1, 1913.

KANSAS CITY, MEXICO & ORIENT.—D. J. Haff is quoted as saying that the chairman of the reorganization committee of the Kansas City, Mexico & Orient, who is now in London, will be in Kansas City next month, and that subscriptions are now being taken for funds to refinance the road, which is in the hands of a receiver, and as saying that it will require between $10,000,000 and $15,000,000 to refinance and complete the road.

KINSTON & SNOW HILL.—See Carolina Railroad.

NEW YORK, NEW HAVEN & HARTFORD.—De Ver H. Warner has been elected a director, succeeding his father, I. De Ver Warner, deceased.

PEORIA RAILWAY TERMINAL.—On March 1, the Chicago, Rock Island & Pacific, and the Chicago & Alton will take over the joint management of the Peoria Railway Terminal Company, which they have jointly owned for some time. President W. T. Irwin will retire, but will be retained in legal capacity. The roads will operate the terminal in alternate years, and the president will also be alternated, so that the first year the property will be operated by the Rock Island, and President B. A. Worthington, of the Chicago & Alton, will serve as president.

PITTSBURGH & LAKE ERIE.—The directors have declared an extra dividend of 5 per cent., payable March 31. This compares with extra dividends of 12 per cent. paid in March, 1912, 25 per cent. in 1911 and 40 per cent. in 1910. The regular dividends are 10 per cent. annually. In three previous years the extra dividend has been accompanied by stock offered to the stockholders for subscription. The company has made no stock offer so far this year.

SOUTHERN PACIFIC.—See the refusal of the California Railroad Commisison to permit certain terms of the Union Pacific-Southern Pacific dissolution plan from being carried out under state commissions.

UNION PACIFIC.—See the refusal of the California Railroad Commission to permit certain terms of the Union Pacific-Southern Pacific dissolution plan from being carried out under state commissions.

BRAZILIAN-PARAGUAYAN RAILWAY CONNECTION.—According to statements made by its promoters, the proposed Paraguay Northeastern Railway, for which a concession was granted in 1911, is to run from Asuncion, Paraguay, northeasterly to the Paraguayan-Brazilian frontier, where it will cross the Parana river. From that point it is proposed to connect with the Transcontinental Brazilian line, which, crossing the states of Parana and Sao Paulo, connects with the main Brazilian system at Itapetininga.

[ADVERTISEMENT.]

ANNUAL REPORT.

SOUTHERN PACIFIC COMPANY TWENTY-EIGHTH ANNUAL REPORT.

INCOME FOR THE YEAR.

The gross receipts and disbursements of the Southern Pacific Company in respect of its leased lines and of the Proprietary Companies in respect of lines not leased, and the other receipts and disbursements of the Southern Pacific Company and of such Proprietary Companies after excluding all offsetting transactions between them, were as follows:

	This Year.	Last Year.	+ Increase. — Decrease.
Average miles of railway operated—proprietary and non-proprietary:			
Lines East of El Paso	3,434.97	3,402.88	+32.09
Lines West of El Paso	6,535.43	6,492.19	+43.24
Total	9,970.40	9,895.07	+75.33
OPERATING INCOME.			
Revenue from transportation —rail lines	$120,433,055.64	$121,911,028.10	—$1,477,972.46
Revenue from outside operations	11,092,114.95	10,709,511.41	+382,603.54
Total	$131,525.170.59	$132,620,539.51	—$1,095,368.92
Operating expense—rail lines.	$75,652,106.32	$74,521,659.84	+$1,130.446.48
Expenses outside operations..	10,838,936.91	10,483,554.02	+355,382.89
Taxes (rail lines and properties dealt with as outside operations)	5,621,238.96	4,850,347.57	+770,891.39
Total	$92,112,282.19	$89,855,561.43	+$2,256,720.76
Net operating income over expenses and taxes	$39,412,888.40	$42,764,978.08	—$3,352.089.68
OTHER INCOME.			
Interest on bonds owned of Proprietary Companies (Table No. 4)	$2,040,929.85	$1,051,971.39	+$988,958.46
Interest on bonds owned of companies other than Proprietary Companies (Table No. 5)	2,670,883.49	2,935,575.94	—264,692.45
Dividends on stocks owned of companies other than Proprietary Companies (Table No. 6)	1,066,908.44	781,796.08	+285,112.36
Income from lands and securities not pledged for redemption of bonds	740,146.64	956,529.05	—216,382.41
Income from sinking funds pledged for the redemption of bonds	219,314.11	93,532.54	+125,781.57
Rentals for lease of road, for joint tracks, yards, and other facilities	.....	106,412.43	—106,412.43
Balance of interest received on loans and of interest accruing to June 30, on open accounts other than with Proprietary Companies	1,995,762.27	728,454,03	+1,267,308.24
Miscellaneous income	118,574.56	80,917.41	+37,657.15
Total	$8,852,519.36	$6,735,188.87	+$2,117,330.49
Total net operating and other income	$48,265,407.76	$49,500,166.95	—$1,234,759.19
FIXED AND OTHER CHARGES.			
Interest on outstanding funded debt of Southern Pacific Co. and Proprietary Companies (Table No. 7)	$23,559,447.38	$20,897,152.53	+$2,662,294.85
Sinking fund contributions and income from sinking fund investments	501,494.11	374,712.54	+126,781.57
Hire of equipment—balance.	642,158.52	250,481.77	+391,676.75
Rentals for lease of road, for joint tracks, yards, and other facilities	142,307.03	.....	+142,307.03
Land department expenses	187,849.02	225,689.21	—37,840.19
Taxes on granted and other lands	347,528.70	319,517.29	+28,011.41
Miscellaneous expenses	60,585.98	34,121.52	+26,464.46
Taxes and other expenses of Southern Pacific Company.	245,899.01	291,703.42	—45,804.41
Additions and betterments payable from income of Southern Pacific Company.	25,232.60	123,033.79	—97,801.19
Reserve for depreciation of rolling stock owned by Southern Pacific Company and leased to other companies	854,060.67	866,547.65	—12,486.98
Total	$26,566,563.02	$23,382,959.72	+$3,183,603.30
Surplus over fixed and other charges	$21,698,844.74	$26,117,207.23	—$4,418,362.49

ASSETS AND LIABILITIES.

The combined assets and liabilities, excluding therefrom the stocks of the Proprietary Companies deposited against the issue of stocks and bonds of the Southern Pacific Company, also the offsetting open accounts between the Companies, on June 30, 1912, summarized, were as follows:

Capital Assets.		
Cost of road and franchises	$775,446,276.62	
New Mexico & Arizona Railroad Co. and Sonora Railway Co. securities	6,718,000.00	
Stocks and bonds owned by Southern Pacific Company (Tables Nos. 13, 14, and 15)	$379,704,317.62	
Deduct: Stocks and bonds deposited against issue of Southern Pacific Company stock and bonds	232,932,667.41	
	146,771,650.21	
Stocks owned by Proprietary Companies (Table No. 20)	330,316.77	
Bay Shore Line terminals and other real estate	37,998,537.00	
Timber treating plants, saw mills, and other property	349,879,89	
Steamships and other floating equipment (Table No. 25)	13,757,104.89	
Rolling stock (Table No. 26)	20,217,267.00	
Advances for construction and acquisition of new lines	18,243,976.28	
Advances for Oakland-Berkeley electric lines	9,001,020.46	
Advances to Southern Pacific Railroad Co. of Mexico	39,026,799.19	
Advances to electric lines in California and Oregon	9,773,318.12	
Advances to Kern Trading & Oil Co.	8,523,255.92	
Advances to Pacific Fruit Express Co.	1,214,923.37	
Lands and other investments	2,859,564.49	
Advances to Southern Pacific Land Co.	3,560,000.00	
Sinking funds	11,313,997.72	
Trust funds	343,981.17	
		$1,105,449,869.10
Current and Deferred Assets.		
Cash	$11,065,746.61	
Time loans and deposits	250,000.00	
Union Pacific Railroad Co. bond purchase notes	23,740,362.22	
Cash accounts	17,688,174.32	
Material and supplies	15,966,973.79	
Lands and other investments	404,844.38	
		69,116,101.32
Contingent Assets.		
San Antonio & Aransas Pass Ry. Co.	$1,845,607.15	
Expenditures closing crevasse of Colorado River, protection of levees, etc	4,049,434.95	
Unadjusted accounts	900,355.81	
Land Contracts	1,232,689.10	
		8,028,087.01
Total		$1,182,594,057.43

Capital Liabilities.		
Southern Pacific Company, common stock	$272,672,405.64	
Southern Pacific Company, preferred stock called for redemption but not presented.	3,325.00	
Proprietary Companies:		
Common stock (stock deposited against Southern Pacific Company stock and bonds excluded)	73,137,411.00	
Preferred stock (stock deposited against Southern Pacific Company stock and bonds excluded)	12,000,000.00	
		$357,813,141.64
Southern Pacific Company funded debt	$140,587.410.00	
Proprietary Companies funded debt	416,717,962.44	
Bonds of underlying companies	20,000,000.00	
		577,305,372.44
Total stocks and bonds		$935,118,514.08
Current and Deferred Liabilities.		
Interest and dividends matured but not called for	$594,947.63	
Interest and dividends due July 1, and October 1	11,770,374.66	
Interest accrued to June 30, but not due	5,497,399.38	
Due to Union Pacific Railroad Co	12,000,000.00	
Vouchers and payrolls	10,032,203.07	
Other cash accounts	2,185,009.50	
Deferred liabilities	2,183,351.75	
		44,263,285.99

Contingent Liabilities.		
Insurance funds	$5,438,927.22	
Rolling stock and floating equipment depreciation and replacement funds	9,709,960.18	
Unadjusted accounts	3,113,770.97	
Principal of deferred payments on land contracts	1,955,786.71	
Fund for refunding outstanding old bonds of Southern Pacific R. R. Co	3,735,384.83	
Due to other Proprietary Companies	5,718,326.39	
		29,672,156.30
Difference between par value and charge on books of stocks and bonds of Proprietary Companies pledged against the issue of stocks and bonds of Southern Pacific Company		16,720,493.59
Balance to credit of Profit and Loss		156,819,607.47
Total		$1,182,594,057.43

The number of locomotives and cars of standard gauge owned, and the total and average capacity of freight-train cars at the close of the year were as follows:

STANDARD GAUGE.	THIS YEAR.	LAST YEAR.	+ INCREASE. — DECREASE.	PER CENT.
Locomotives	1,873	1,858	+ 15	.81
Total weight, excluding tender (tons)	145,876	142,493	+ 3,383	2.37
Average weight, excluding tender (tons)	77.88	76.12	+ 1.76	2.31
Total weight on drivers (tons)	120,457	117,491	+ 2,966	2.52
Average weight on drivers (tons)	64.31	62.76	+ 1.55	2.47
Passenger-train cars	2,262	2,192	+ 70	3.19

EQUIPMENT.

The changes in equipment during the year were as follows:

	CONDEMNED, DESTROYED, SOLD OR TRANSFERRED TO ANOTHER CLASS, AND CREDITED TO EQUIPMENT. †		ADDED AND CHARGED TO EQUIPMENT. †		ADDED AND CHARGED TO FREE ASSET, S. P. Co. †		TOTAL. †	
	Number.	Original Cost.	Number.	Cost.	Number.	Cost.	Number.	Cost.
Locomotives	33	$247,923.38	40	$263,468.75	8	$436,154.87	48	$699,623.63
Baggage cars	—		23		*11		12	
Baggage and mail cars	4		3		3		6	
Baggage and passenger cars	8		1		—		1	
Business cars	2		1		1		2	
Chair cars	1		—		52		52	
Dining cars	—		5		*5		—	
Other cars (electric)	—		—		10		10	
Passenger cars	43		—		61		61	
Postal cars	15		6		*7		*1	
Narrow gauge cars	14		14		1		15	
Total passenger-train cars	87	$401,772.01	53	$329,550.26	105	$1,270,471.72	158	$1,600,021.98
Ballast cars	10		230		*230		—	
Box cars	447		2		*17		*15	
Caboose cars	3		10		*10		—	
Flat cars	623		77		*61		16	
Fruit cars	14		—		—		—	
Furniture cars	17		—		—		—	
Gondola cars	31		—		—		—	
Gondola (D. B.) cars	1		—		—		—	
Gondola (H. B.) cars	19		—		*1		*1	
Logging cars	—		75		—		75	
Refrigerator cars	34		—		—		—	
Stock cars	25		—		—		—	
Tank cars	194		—		1		1	
Narrow gauge cars	200		195		—		195	
Total freight-train cars	1,618	$862,418.76	589	$357,300.29	*318	*$340,112.68*	271	$17,187.61
Work equipment	276	$103,934.09	375	$312,609.27	*15	*$85,604.89*	360	$227,004.38
Total	—	$1,616,048.24	—	$1,262,928.58	—	$1,280,909.02	—	$2,543,837.60

NOTE.—There is included in the above equipment belonging to Companies whose properties are operated under leases, viz.: 1 locomotive, 1 passenger and 2 freight cars added, the property of Hanford and Summit Lake Ry. Co.; 3 freight cars added, the property of Porterville Northeastern Ry. Co.; and 10 work cars added, and 1 locomotive, 9 passenger, and 23 freight cars vacated, the property of Sonora Ry. Co.

†Includes following narrow gauge equipment transferred between Proprietary Companies: 13 locomotives, 13 passenger cars, 195 freight cars, and 18 work cars. *Sold by Southern Pacific Company to Proprietary Companies.

The original cost and salvage value of equipment retired during the year, and the amount charged to operating expenses in respect thereof, were as follows:

	TOTAL.	LOCOMOTIVES.	PASSENGER-TRAIN CARS.	FREIGHT-TRAIN CARS.	WORK EQUIPMENT.
Original cost (estimated if not known)	$1,616,048.24	$247,923.38	$401,772.01	$862,418.76	$103,934.09
Proceeds from sale or salvage value	821,964.48	73,643.70	231,594.28	463,615.38	53,111.12
Charged to operating expenses	$794,083.76	$174,279.68	$170,177.73	$398,803.38	$50,822.97

The locomotives added during the year averaged 142.91 tons total weight of engine, without tender, and 122.45 tons upon drivers.

STANDARD GAUGE.	THIS YEAR.	LAST YEAR.	+ INCREASE. — DECREASE.	PER CENT.
Freight-train cars	48,183	49,525	— 1,342	2.71
Total capacity (tons)	1,940,058	1,917,650	+ 22,408	1.17
Average capacity (tons)	40.89	40.41	— .25	.62
Work equipment	5,388	5,301	+ 87	1.64

The equipment owned by the respective companies is shown in Tables Nos. 25 and 26. The changes during the year, the capacity, and the service of all equipment, are shown in Tables Nos. 34, 35 and 36.

TRANSPORTATION OPERATIONS.

The results of the year's transportation operations compared with those of the preceding year are as follows:

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Average miles of railway operated	9,970.40	9,895.07	75.33	.76
OPERATING INCOME.				
Freight	$72,648,091.65	$73,677,292.78	—$1,029,201.13	1.40
Passenger	40,269,238.03	40,814,399.52	—545,161.49	1.34
Mail	2,472,768.90	2,474,263.34	—1,494.44	.06
Express	2,517,086.23	2,691,685.53	—174,599.30	6.49
Other transportation revenues	1,223,329.20	1,146,768.81	76,560.39	6.68
Revenues from operations other than transportation	1,302,541.63	1,106,618.12	195,923.51	17.70
Total, rail lines	$120,433,055.64	$121,911,028.10	—$1,477,972.46	1.21
Revenues from outside operations	11,092,114.95	10,709,511.41	382,603.54	3.57
Total gross operating income	$131,525,170.59	$132,620,539.51	—$1,095,368.92	.83
OPERATING EXPENSES.				
Maintenance of way and structures	$14,464,204.81	$15,889,129.83	—$1,424,925.02	8.97
Maintenance of equipment	16,318,140.51	15,312,205.79	1,005,934.72	6.57
Traffic expenses	3,201,366.63	2,947,063.58	254,303.05	8.63
Transportaion expenses	38,270,811.05	36,524,585.10	1,746,225.95	4.78
General expenses	3,397,583.32	3,848,675.54	—451,092.22	11.72
Total, rail lines	$75,652,106.32	$74,521,659.84	$1,130,446.48	1.52
Expenses outside operations	10,838,936.91	10,483,554.02	355,382.89	3.39
Total operating expenses	$86,491,043.23	$85,005,213.86	$1,485,829.37	1.75
Net operating income	$45,034,127.36	$47,615,325.65	—$2,581,198.29	5.42
FREIGHT TRAFFIC.				
(Commercial Freight Only —Way-bill Tonnage.)				
Tons of freight carried	26,950,150	26,145,241	804,909	3.08
Tons of freight carried one mile	6,145,555,486	6,066,777,657	78,777,829	1.30
Ton miles per mile of road (a)	615,843	612,443	3,400	.56
Revenue per mile of road (a)	$7,123.32	$7,190.39	—$67.07	.93
Revenue per *revenue train* mile (a) (b)	$4.42	$4.51	—$0.09	2.00
Average revenue per ton per mile	1.168 cents	1.186 cents	—.018 cents	1.52
Average distance carried	228.03 miles	232.04 miles	—4.01 miles	1.73
PASSENGER TRAFFIC.				
Revenue passengers carried	40,329,011	39,989,058	339,953	.85
Revenue passengers carried one mile	1,787,640,025	1,808,133,603	—20,493,578	1.13
Revenue from passenger trains per mile of road (a)	$4,468.67	$4,570.09	—$101.42	2.22
Revenue from passenger trains per *revenue train* mile (a) (c)	$1.65	$1.78	—$0.13	7.30
Average revenue per passenger per mile	2.208 cents	2.215 cents	—.007 cents	.32
Average distance carried	44.32 miles	45.22 miles	—.90 miles	1.99

(a) Based on traffic over rail lines only, length of ferries used between rail stations excluded in distance over which traffic was moved. (b) Revenue freight train and all mixed train miles. (c) Revenue passenger train and all mixed train miles, including miles run by motor cars.

Compared with the previous year, the per cent. of operating expenses to the gross revenues was as follows:

RAIL LINES.	This Year.	Last Year.
For "Maintenance" (*Maintenance of Way and Structures and Maintenance of Equipment*)	25.56	25.59
For "Operation" (*Traffic Expenses, Transportation Expenses, and General Expenses*)	37.26	35.54
Total rail lines	62.82	61.13
Total rail lines and outside operations	65.76	64.10

The operating income and operating expenses for the year for all lines, distributed in accordance with the accounting regulations of the Interstate Commerce Commission, are shown in Table No. 29, and for each Company in Table No. 30. Details of passenger and freight traffic are shown in Tables Nos. 32 and 33.

The expenses of the rail lines for "Maintenance" decreased $418,990.30, or 1.34 per cent.; but expenses for "Operation" increased $1,549,436.78, or 3.58 per cent., a net increase of $1,130,446.48, or 1.52 per cent. The increase in expenses for "Operation" resulted from 1,539,233, or 5.61 per cent., more miles run by locomotives and motor cars in passenger service and of 680,459, or 3.54 per cent., more miles run by locomotives in freight service; from the additional expenses imposed by the requirements of the "Hours of Service" and "Full Train Crew" laws, and from higher wage schedules.

There were in service 34 gasoline and 65 electric motor cars. The mileage of these cars, 2,095,210 miles, or 8.28 per cent. of the total revenue passenger train mileage, is included in the mileage statistics.

In the following statements the details of operating expenses have been combined under titles of accounts to present the year's expenses in concise form.

At the timber-treating plants of the Companies, 2,375,830 cross ties and 17,695 switch ties were burnettized, and 667,765 cubic feet of piling and other timber were creosoted.

MAINTENANCE OF WAY AND STRUCTURES.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Average miles of railway operated and maintained —first and additional main tracks	10,252.85	10,113.64	139.21	1.38
Ballast	$129,909.71	$224,782.13	—$94,872.42	42.21
Ties	1,908,202.60	2,004,200.00	—95,997.40	4.79
Rails	398,814.82	757,163.48	—358,348.66	47.33
Frogs, switches, and other track material	1,224,138.25	1,509,563.48	—285,425.23	18.91
Total material for roadway and track.	$3,661,065.38	$4,495,709.09	—$834,643.71	18.57
Repairs of roadway and track	6,045,252.50	6,499,314.98	—454,062.48	4.99
Bridges, trestles and culverts	935,996.64	1,178,396.55	—242,399.91	20.57
Buildings, grounds, and appurtenances	2,284,330.29	2,210,535.30	73,794.99	3.34
Snow and sand fences and snow sheds	160,706.41	147,113.53	13,592.88	9.24
Electric power, telegraph, and telephone lines	142,398.65	113,589.79	28,808.86	25.36
Superintendence	948,597.10	873,995.05	74,602.05	8.54
Stationery and printing	37,300.40	39,230.62	—1,930.22	4.92
Other expenses	79,046.01	69,124.83	9,921.18	14.35
Property abandoned	169,511.43	262,120.09	—92,608.66	35.33
Total	$14,464,204.81	$15,889,129.83	—$1,424,925.02	8.97
Cost per mile—all main tracks	$1,410.75	$1,571.06	—$160.31	10.20

The expenses include $146,556.85, for extraordinary repairs to road-bed during high water in Louisiana and other protection work.

The following rails, ties, tie plates, and continuous rail joints were used in making renewals and the entire cost thereof charged to operating expenses, with the exception of $286,155.61 for increased weight of rail and improved frogs and switches charged to additions and betterments in accordance with the Classification of Expenditures for Additions and Betterments promulgated by the Interstate Commerce Commission:

	This Year.	Last Year.	Increase or Decrease.
Mileage of new steel rails (track miles)	256.82	483.11	—226.29
Per cent. of renewal of all rail in track, including sidings	1.84	3.56	—1.72
Number of burnettized ties	2,161,885	2,211,334	—49,449
Number of other ties	1,446,551	1,378,821	67,730
Total number of ties	3,608,436	3,590,155	18,281
Equal to miles of continuous track	1,271.92	1,258.44	13.48
Per cent. of renewal of all ties in track, including sidings	9.14	9.27	—.13
Number of tie plates	4,069,475	5,365,865	—1,296,390
Equal to miles of continuous track	717.46	940.43	—222.97
Number of continuous rail joints	277,723	372,598	—94,875
Equal to miles of continuous track	433.94	582.19	—148.25

The weight of rails per yard in main line and branches at the close of the year was as follows:

Miles of first and additional main tracks operated and maintained.	Total.	164-lb.	141-lb.	116-lb.	96-lb.	90-lb.	80-lb.	76-lb. and 75-lb.	70-lb.	65-lb.	61.5 lb. and 60-lb.	56-lb. and 54-lb.	52-lb. and less than 52-lb.
Main line	5,727.11	.....	1.15	.....	20.36	1,382.80	2,498.71	1,686.73	.....	.....	109.68	.98	26.70
Branches	4,669.97	.31	9.53	5.53	.02	263.52	209.70	926.98	9.44	264.43	1,431.07	404.07	1,145.37
Total	10,397.08	.31	10.68	5.53	20.38	1,646.32	2,708.41	2,613.71	9.44	264.43	1,540.75	405.05	1,172.07
Per cent. of total miles of track	100.00	.....	.10	.05	.20	15.84	26.05	25.14	.09	2.54	14.82	3.90	11.27
Per cent. last year	100.00	.....	.03	.....	.20	12.55	26.87	26.18	.09	2.61	15.92	4.08	11.47

MAINTENANCE OF EQUIPMENT.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Locomotives	$7,320,342.48	$6,352,424.32	$967,918.16	15.24
Passenger train cars	1,801,686.66	1,840,836.49	—39,149.83	2.13
Freight train cars	4,719,238.48	5,307,918.95	—588,680.47	11.09
Work equipment	260,253.95	375,290.21	—115,036.26	30.65
Floating equipment	274,071.96	307,408.23	—33,336.27	10.84
Shop machinery and tools.	355,089.96	361,183.79	—6,093.83	1.69
Superintendence	680,247.27	640,961.50	39,285.77	6.13
Other expenses	907,209.75	126,182.30	781,027.45	618.97
Total	$16,318,140.51	$15,312,205.79	$1,005,934.72	6.57

As in the past, the companies have charged to operating expenses the original cost (estimated if not known) or purchase price, less salvage, of all rolling stock condemned, destroyed, sold, or vacated from any cause during the year. The sums thus charged are reported under "Renewals" in Table No. 29, and amounted for the year to $794,083.76.

The average cost of repairs and renewals per locomotive (excluding motor cars) and per car per annum, and the average number of serviceable locomotives and cars owned during the year were:

AVERAGE COST PER ANNUM.

	(*Including original cost, less salvage of equipment vacated.*) This Year.	Last Year.	AVERAGE SERVICEABLE NUMBER. This Year.	Last Year.
Locomotives, for repairs	$3,800.00	$3,361.12		
for renewals	93.10	155.17		
Total	$3,893.10	$3,516.29	1,872	1,803
Passenger train cars, for repairs	$794.56	$1,005.73		
for renewals	76.01	44.30		
Total	$870.57	$1,050.03	2,239	2,019
Freight train cars, for repairs	$90.16	$101.80		
for renewals.	8.32	11.55		
Total	$98.48	$113.35	47,921	46,829

The rolling stock owned by the respective Companies is shown in Table No. 26, and the capacity, the service, and the average cost of maintenance, are shown in Tables Nos. 34, 35 and 36.

TRAFFIC EXPENSES.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Outside agencies	$1,090,985.55	$1,027,790.73	$63,194.82	6.15
Advertising	911,497.12	1,027,180.27	—115,683.15	11.26
Superintendence	932,737.04	638,244.61	294,492.43	46.14
Stationery and printing	228,690.27	217,047.51	11,642.76	5.36
Other expenses	37,456.65	36,800.46	656.19	1.78
	$3,201,366.63	$2,947,063.58	$254,303.05	8.63

The increase in "Superintendence" resulted principally from the transfer to this account of the salaries and expenses of the Freight Claim Department, which were last year dealt with as an item in "General Expenses."

TRANSPORTATION EXPENSES.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Locomotives, fuel for	$9,176,120.72	$9,423,602.40	—$247,481.68	2.63
Locomotive service, other than fuel	8,229,137.42	7,520,221.55	708,915.87	9.43
Train service	6,773,458.48	6,127,538.50	645,919.98	10.54
Station and terminal service	9,211,434.86	8,838,858.98	372,575.88	4.22
Ferry and river service	660,105.20	660,885.07	—779.87	.12
Injuries, loss, damage and other casualties	2,228,867.27	1,946,513.04	282,354.23	14.51
Superintendence	1,566,454.90	1,572,868.21	—6,413.31	.41
Stationery and printing	305,294.38	328,563.15	—23,268.77	7.08
Other expenses	119,937.82	105,534.20	14,403.62	13.65
	$38,270,811.05	$36,524,585.10	$1,746,225.95	4.78

The work done by the transportation department of the rail lines compared with that of last year is as follows:

	Increase.	Decrease.	Per Cent.
Total operating revenues	.....	$1,477,972.46	1.21
Transportation expenses	$1,746,225.95	.....	4.78
Tons of commercial freight carried one mile	78,777,829	.....	1.30
Tons of commercial and company freight carried one mile	.....	147,690,603	1.98
Mileage of cars in freight service, including caboose	.....	7,857,340	1.48
Locomotive mileage with freight and mixed trains, including helping	680,459	.....	3.54
Revenue passengers carried one mile	.....	20,493,578	1.13
Mileage of cars in passenger service (including motor cars and trailers)	4,027,604	.....	2.52
Mileage of motor cars (excluding trailers)	1,409,122	.....	205.39
Locomotive mileage with passenger and mixed trains, including helping	130,111	.....	.49
Total locomotive mileage in service for which the attendant expenses are charged to "Transportation Expenses"	648,969	.....	1.24

*Ton miles per revenue freight train and all mixed train miles.

The cost of fuel per locomotive mile run in revenue service and in non-revenue service for which the expenses are charged to "Transportation Expenses" was 17.33 cents against 17.93 cents last year.

GENERAL EXPENSES.

	This Year.	Last Year.	Increase or Decrease.	Per Cent.
Salaries and expenses of general officers	$320,634.44	$287,889.88	$32,744.56	11.37
Salaries and expenses of clerks and attendants	1,497,055.49	1,838,686.48	—341,330.99	18.58
Law expenses	437,668.27	506,785.83	—69,117.56	13.64
General office expenses	249,756.76	215,899.22	33,857.54	15.68
Stationery and printing	135,321.90	165,839.92	—30,518.02	18.40
Insurance	340,213.16	340,941.02	—727.86	.21
Pensions	219,374.19	182,482.41	36,891.78	20.22
Other expenses	197,559.11	310,150.78	—112,591.67	36.30
Total	$3,397,583.32	$3,848,675.54	—$451,092.22	11.72

The decrease in "Salaries and expenses of clerks and attendants" resulted principally from the transfer of the salaries and expenses of the Freight Claim Department, which were this year dealt with as an item in "Traffic expenses."

The average number of tons of freight per train, of loaded cars per train (excluding caboose), and of tons per loaded car for the year were:

COMMERCIAL AND COMPANY FREIGHT. (Way-bill Tonnage.)	*TONS PER TRAIN. Tons.	+Increase. —Decrease. Tons.	Per Cent.	LOADED CARS PER TRAIN. Cars.	+Increase. —Decrease. Cars.	Per Cent.	PER CENT. OF LOADED CAR MILEAGE TO TOTAL CAR MILEAGE.	TONS PER LOADED CAR. Tons.	+Increase. —Decrease. Tons.	Per Cent.
Lines East of El Paso	354.84	—32.52	8.39	18.58	—.80	4.13	73.02+4.20	19.10	—.89	4.45
Lines West of El Paso	514.19	—13.68	2.59	25.12	—.42	1.64	71.70— .36	20.47	—.20	.97
Average all lines	455.73	—18.20	3.84	22.72	—.46	1.98	72.10+1.11	20.06	—.39	1.91

GENERAL.

Under the requirements of the concessions granted for the construction of the railway of the Southern Pacific Railroad Company of Mexico, referred to in former reports, there were completed during the year 31.12 miles between Mazatlan and Tepic, which places the present end of track about 0.50 miles south of the station in the City of Tepic. Including the 39.50 miles of railway—Naco to Cananea, Sonora—purchased in 1902 from the Cananea Consolidated Copper Company, the completed mileage, June 30, 1912, is 982.42.

The miles of railway projected under the concessions, the line completed, under construction, and remaining to be constructed are as follows:

	Projected. Miles.	Constructed to June 30, 1912. Miles.	Remaining to be Built. Under Construction. Miles.	Remaining to be Built. To be Built. Miles.
Main Line — Empalme to Guadalajara	815.20	713.55	2.18	99.47
Branch Lines (Including Naco-Cananea Line)	691.56	268.87	—	422.69
Total	1,506.76	982.42	2.18	522.16

Under the concession as revised November 5, 1910, the time for the completion of the main line from Empalme to Guadalajara was extended to November 6, 1915, and for the branch lines to November 11, 1920.

The advances by the Southern Pacific Company for account of the construction of these lines amounted, on June 30, 1912, to $39,026,799.19. Interest charges accruing on these advances during the year have not been taken into either the assets or income of the Company.

The revolutionary depredation claims, amounting to 288,118.74 pesos, are still pending before the Mexican Government. Settlement has been retarded by the fact that the Mexican Government, since February, 1912, has been engaged in attempting to suppress an insurrection which first manifested itself in the States of Sinaloa and Chihuahua. On the main line from Empalme to Tepic, twenty-three wooden trestles, having a total length of 2,985 lineal feet, and on the Corral-Tonichi Branch, four wooden trestles, having a total length of 240 lineal feet, were destroyed by the insurrectos between February 14 and June 30, 1912. Claims for compensation for the destruction of this property will be presented to the Mexican Government.

In addition to the completed lines of railway reported under "Properties and Mileage" and the railway of the Southern Pacific Railroad Company of Mexico, above referred to, construction either was completed or is progressing, on the lines of the following companies or of companies organized in the interest of the Southern Pacific Company:

	Length of Projected Line. Miles.	Track Completed. Miles.	Grading Completed. Miles.	Grading Progressing. Miles.
Central Pacific Railway:				
Fernley, Nev., to Walker Mill Junction, Cal.	135.00	—	5.59	129.41
Oreana, Nev., to Rose Creek, Nev. (second track)	47.81	17.60	30.21	
Colusa & Hamilton Railroad:				
Hamilton, Cal., to Harrington Cal.	61.15	—	45.70	15.45
Pacific Railway & Navigation Company:				
Hillsboro, Ore., to Tillamook, Ore.	91.16	91.16		
Willamette Pacific Railroad:				
Eugene, Ore., to Marshfield, Ore.	130.00	—	8.40	121.60

A considerable part of the Company's records in its New York office in the building of the Equitable Life Assurance Society at No. 120 Broadway, were lost or impaired in the fire on January 9, 1912, which destroyed said building. Such of these records as were copies of statements received from the New Orleans, Houston, Tucson and San Francisco offices were readily replaced, and the remaining records were supplied from the full and complete details of the company's operations and transactions published annually in its reports, and the stated and special reports made to the Interstate Commerce Commission from time to time in respect of its affairs.

In the summer of 1911 the Machinists, Boilermakers, Blacksmiths, Car Repairers, and Sheet Metal Workers on the Southern Pacific and Union Pacific systems formed a Federation and presented demands involving an increase in wages aggregating thirty-six per cent. and working rules and conditions which would have seriously abridged the Company's ability to perform its duties to the public as well as to its stockholders. The employes were so informed, but at the same time were assured that the Company was willing to continue working agreements as theretofore with individual crafts, recognizing but without discriminating in favor of or against the different unions. A general strike was declared on September 30, 1911, and 5,189 employes of the Southern Pacific System and 3,042 of the Union Pacific System responded. Their places were soon filled, but, of course, many unskilled workmen were among those first employed and several months elapsed before all of these were replaced and the new force was brought up to the proper state of efficiency. Heavy expenses were incurred in hiring guards to protect the employes of the Company from violence and prevent damage to the Company's property, and much annoyance and inconvenience in the conduct of the Company's business ensued; but the expense, loss and inconvenience were very much less than anticipated when the strike occurred.

There has been a gratifying increase in the earnings beginning with the current fiscal year. The large crops throughout the country have given an impetus to business, and the prospects for a good business year are most encouraging. The operating income for the first six months of the current fiscal year compares with that of the previous year as follows:

	1912.	1911.	Increase.
Gross revenue	$75,648,104.61	$69,069,365.41	$6,578,739.20
Operating expenses	$46,041,570.26	$43,200,884.30	$2,840,685.96
Taxes	2,916,870.21	2,633,665.40	283,204.81
Total expenses and taxes	$48,958,440.47	$45,834,549.70	$3,123,890.77
Revenue over operating expenses and taxes	$26,689,664.14	$23,234,815.71	$3,454,848.43

Under the pension system put into effect on January 1, 1903, there are carried on the pension rolls of the rail and water lines 575 employes. The payments to them for the year amounted to $229,666.79.

The accompanying report of the Vice-President and Controller shows fully and in detail the financial and other transactions of the Companies.

By order of the Board of Directors,

ROBERT S. LOVETT,
Chairman of the Executive Committee.

SOUTHERN PACIFIC COMPANY AND PROPRIETARY COMPANIES.

No. 2.—Combined Income Account for the Year Ended June 30, 1912.
(Revenues and Expenses of "Proprietary" and Non-Proprietary" Lines and Miscellaneous Income of the Southern Pacific Company and Proprietary Companies, combining details shown in Tables Nos. 10 and 16.)

Operating expenses (and taxes) of proprietary lines, interest on funded debt and all other expenses of Proprietary Companies as shown in detail in Table No. 16		$109,744,453.15
Operating expenses, taxes, and all other expenses incurred in connection with the operation of the following non-proprietary lines:		
New Mexico & Arizona R. R.	$116,819.24	
Sonora Railway	905,709.16	
		1,022,528.40
Disbursements of Southern Pacific Company (Table No. 10):		
Expenses of operating steamship lines		6,988,547.56
Interest on funded debt (Table No. 7)		5,418,562.99
Interest due to Proprietary Companies on advances and open accounts	$2,825,926.18	
Less interest due from Proprietary Companies	1,106,579.40	
		1,719,346.78
Rental to Central Pacific Ry. Co.		10,000.00
Rental to Nevada & California Ry. Co.		3,333.33
Rental to Oregon & California R. R. Co.		5,000.00
Rental to Southern Pacific R. R. Co.		10,000.00
Taxes		193,382.36
General and miscellaneous expenses		52,516.65
Annual payment for redemption of San Francisco Terminal bonds		5,000.00
Reserve for depreciation of rolling stock owned and leased to other companies		854,060.67
Cost of surveys written off		30,242.67
Cost of examinations for water power written off		65,449.09
Balance to profit and loss (Table No. 3)		21,603,152.98
Total		$147,725,576.63
Revenues of proprietary lines and miscellaneous income of Proprietary Companies as shown in detail in Table No. 16.		$127,996,250.42
Revenues of the following non-proprietary lines:		
New Mexico & Arizona R. R.	$60,176.94	
Sonora Railway	743,957.80	
		804,134.74
Revenues of Southern Pacific Company (Table No. 10):		
Gross revenues from operation of steamship lines		7,382,431.96
Interest on bonds owned of Proprietary Companies (Table No. 4)		1,847,879.84
Interest on bonds owned of companies other than Proprietary Companies (Table No. 5)		2,670,043.49
Dividends on stocks owned (Table No. 6)		1,063,983.94
Rentals from lease of road		1,669,537.17
Hire of equipment		2,248,822.50
Rentals from lease of joint tracks, yards, and terminal facilities		12,511.96
Miscellaneous rentals		35,005.93
Proceeds from sale and lease of lands		43,357.09
Balance of interest on loans and on open accounts other than with Proprietary Companies		1,937,001.32
Miscellaneous income		14,616.27
Total		$147,725,576.63

SOUTHERN PACIFIC COMPANY AND PROPRIETARY COMPANIES.

No. 3.—Combined Profit and Loss—Year Ended June 30, 1912.
(Combining details as shown in Tables Nos. 11 and 17.)

Dividends on stocks of Proprietary Companies, viz.:		
Central Pacific Ry. Co. preferred	$692,000.00	
Central Pacific Ry. Co. common	4,036,530.00	
Houston, East & West Texas Ry. Co.	211,200.00	
Houston & Shreveport R. R. Co.	120,000.00	
Iberia & Vermilion R. R. Co.	150,000.00	
Louisiana Western R. R. Co.	336,000.00	
Morgan's Louisiana & Texas R. R. & S. S. Co.	600,000.00	
Southern Pacific R. R. Co.	9,600,000.00	
Southern Pacific Terminal Co.	120,000.00	
	$15,865,730.00	
Less paid to:		
Southern Pacific Company	$15,714,887.00	
Morgan's Louisiana & Texas R. R. & S. S. Co.	150,000.00	
	15,864,887.00	
		$843.00

Dividends on common stock of Southern Pacific Co., viz.:		
One and one-half per cent. paid January 2, 1912	$4,090,086.08	
One and one-half per cent. paid April 1, 1912	4,090,086.08	
One and one-half per cent. payable July 1, 1912	4,090,086.08	
One and one-half per cent. payable October 1, 1912	4,090,086.08	
		16,360,344.32
Discount and commissions on securities sold		3,149,516.12
Difference between cost on books and amount received for property sold		109,455.37
Cost on books, less salvage, of property abandoned		208,407.34
Uncollectible accounts written off		34,385.50
Fund for refunding outstanding old bonds of Southern Pacific R. R. Co.		2,500,000.00
Advances to collateral enterprises written off		150,278.72
Payment of old accounts		3,396.58
Losses San Francisco fire, April, 1906		44,787.51
Miscellaneous payments		24,001.13
Adjustment in accounts		410.91
Balance June 30, 1912, viz.:		
Southern Pacific Company	$66,839,197.55	
Proprietary Companies	89,980,409.92	
		156,819,607.47
		$179,405,433.97

Balance June 30, 1911, viz.:		
Southern Pacific Company	$64,137,198.01	
Proprietary Companies, including expenditures for additions and betterments paid for out of income—Table No. 17	$87,022,899.43	
		$151,160,097.44
Balance from income account (Table No. 2)		21,603,152.98
Proceeds from sale of unpledged lands		126,740.11
Proceeds from sale of lands pledged for the redemption of bonds		4,948,686.63
Collection of old accounts		4,354.30
Annual payments to sinking funds and income from sinking fund investments		526,769.11
Profit on stocks and bonds sold		263,931.07
Difference between cost and face value of $690,500 Central Pacific Ry. Three and One-Half Per Cent., $26,000 Central Pacific Ry. First Refunding Four Per Cent., $12,000 Southern Pacific R. R. First Refunding Mortgage Four Per Cent. and $5,000 Southern Pacific Co. San Francisco Terminal First Mortgage Four Per Cent. Bonds purchased and retired		62,125.38
Contingent liabilities written off		261,475.60
Miscellaneous receipts		163,851.71
Old accounts written off		10,310.55
Nevada & California Ry. Co. liquidation		96,185.77
Interest accruing prior to July 1, 1911, on bonds owned		177,753.32
		$179,405,433.97

NO. 12—SOUTHERN PACIFIC COMPANY—ASSETS—JUNE 30, 1912.

Assets.	June 30, 1912.	June 30, 1911.
Capital Assets.		
Stocks and bonds owned—Tables Nos. 13, 14 and 15	$379,704,317.62	$342,139,975.55
Bay Shore Line Terminals, and other real estate	37,998,537.00	36,647,704.94
Timber treating plants, saw mills, and other property	349,879.89	389,723.95
Steamships and other floating equipment—Table No. 25	13,757,104.89	13,767,289.43
Rolling stock—Table No. 26	20,217,267.00	18,847,153.50
Advances for Oakland—Berkeley electric lines	9,001,020.46	6,578,294.90
Advances for construction and acquisition of new lines	18,243,976.28	42,550,193.07
Advances to Southern Pacific Railroad Co. of Mexico	39,026,799.19	38,138,720.60
Advances to electric lines in California and Oregon	9,773,318.12	14,244,045.22
Advances to Kern Trading & Oil Co.	8,523,255.92	5,129,821.49
Advances to Pacific Fruit Express Co.	1,214,923.37	2,208,492.79
Lands and other investments	2,859,564.49	2,531,599.07
Advances to Southern Pacific Land Co.	3,560,000.00	.....
	$544,229,964.23	$523,173,014.51
Sinking funds	635.41	295.83
	$544,230,599.64	$523,173,310.34
Current Assets.		
Cash	$10,418,074.64	$11,139,809.25
Time loans and deposits	250,000.00	24,963,456.67
Loans and notes receivable	1,167,198.74	1,023,927.54
Agents and conductors	1,495,942.60	1,098,284.52
Income accrued to June 30, on securities owned	2,261,059.36	1,247,131.30
Individuals and companies	2,626,585.25	2,744,429.42
U. S. Government transportation	805,268.08	780,796.19
Material and supplies	11,651,972.14	13,895,338.50
Union Pacific Railroad Co. bond purchase notes	23,740,362.22	.....
	$54,416,463.03	$56,893,173.39
Deferred Assets.		
Individuals and companies	.....	$461,074.69
Proprietary Companies.		
Direct Navigation Co.	$59,418.81	$38,789.18
Galveston, Harrisburg & San Antonio Ry. Co.	10,989,463.33	10,575,823.87
Houston, East & West Texas Ry. Co.	29,379.11	.....
Louisiana Western R. R. Co.	58,090.00	83,462.87
Morgan's Louisiana & Texas R. R. & S. S. Co.	1,769,416.63	1,598,248.49
Nevada & California Ry. Co.	.....	199,723.84
Oregon & California R. R. Co.	3,178,670.46	3,771,116.87
Texas & New Orleans R. R. Co.	412,322.18	48,496.54
	$16,496,760.52	$16,315,661.66
Due from other Proprietary Companies	$667,508.01	$537,779.77
Contingent Assets.		
San Antonio & Aransas Pass Ry. Co.*	$1,845,607.15	$1,754,700.09
Individuals and companies	364,367.14	380,321.57
Unadjusted accounts—Proprietary Companies	15,153.05	109,885.69
Expended for account of Colorado River Crevasse	4,049,434.95	4,040,648.61
	$6,274,562.29	$6,285,555.96
Total assets	$622,085,893.49	$603,666,555.81

*Includes $3,898,000, face value, San Antonio & Aransas Pass Ry. Co. Income Four Per Cent. Bonds at 5 per cent. of their face value. Interest on these bonds is payable on January 1st of each year, if earned, out of net earnings and income.

NO. 12—SOUTHERN PACIFIC COMPANY—LIABILITIES—JUNE 30, 1912.

Liabilities.	June 30, 1912.	June 30, 1911.
Capital Liabilities.		
Common Stock	$272,672,405.64	$272,672,405.64
Preferred stock called for redemption but not presented	3,325.00	3,325.00
Total capital stocks	$272,675,730.64	$272,675,730.64
Four per cent. gold bonds (Central Pacific Stock Collateral), due August 1, 1949	$34,218,500.00	$28,769,500.00
Four per cent. twenty-year convertible bonds, due June 1, 1929	81,148,000.00	81,148,000.00
Four per cent. convertible bonds—subscription receipts and scrip	3,910.00	3,910.00
Four and one-half per cent. twenty-year gold bonds, due July 1, 1929	227,000.00	227,000.00
San Francisco Terminal first mortgage four per cent. bonds, due April 1, 1950.	24,990,000.00	18,995,000.00
Total funded debt	$140,587,410.00	$129,143,410.00
	$413,263,140.64	$401,819,140.64
Current Liabilities.		
Coupons matured but not presented	$136,919.50	$92,609.50
Coupons due July 1	3,305,132.50	3,104,232.50
Interest accrued on bonds and loans to June 30, but not due	4,608,182.85	3,971,133.33
Dividends due—unpaid	29,718.16	139,956.96
Dividends due, July 1 and October 1	8,180,172.16	8,180,172.16
Traffic and car service	1,007,989.95	653,076.76
Due to Union Pacific Railroad Company	12,000,000.00	20,007,305.41
Vouchers and payrolls	7,531,340.57	7,656,407.53
	$36,799,455.69	$43,804,894.15
Deferred Liabilities.		
Pacific Mail Steamship Co.	$93,697.40	$79,567.35
Taxes assessed but not due	548,104.00	439,935.60
Wells Fargo & Co.'s Express contract	80,000.00	112,000.00
Sinking fund uninvested	635.41	295.83
Individuals and companies	458,208.34	.....
	$1,180,645.15	$631,798.78
Proprietary Companies.		
Central Pacific Ry. Co.	$29,416,986.98	$34,639,092.32
Houston, East and West Texas Ry. Co.	.....	264,723.50
Houston & Shreveport R. R. Co.	47,397.91	22,850.52
Houston & Texas Central R. R. Co.	1,161,507.13	1,586,952.80
Southern Pacific Railroad Co.	50,119,915.10	39,623,464.90
Southern Pacific Terminal Co.	12,521.21	4,133.10
	$80,758,328.33	$76,141,217.14
Due to other Proprietary Companies	$6,385,834.40	$2,313,064.67
Contingent Liabilities.		
Marine insurance fund	$3,163,535.48	$3,175,954.02
Steamship insurance fund	1,607,697.54	1,607,697.54
Floating equipment replacement fund	6,434,380.10	5,571,623.83
Reserve for replacement and depreciation of rolling stock	2,021,813.92	1,253,188.65
Insurance fund	507,193.52	353,599.16
Unadjusted accounts	3,054,573.37	2,743,926.39
Principal of deferred payments on land contracts	70,097.80	113,252.83
	$16,859,291.73	$14,819,242.42
Total liabilities	$555,246,695.94	$539,529,357.80
Balance to credit of profit and loss	66,839,197.55	64,137,198.01
Total liabilities	$622,085,893.49	$603,666,555.81